

Doc. No.: EGG-WM-9979
Section No. H&S Plan
Revision No. 3
Date November 1991
Page No. i

HEALTH AND SAFETY PLAN
FOR
OPERATIONS PERFORMED FOR THE
ENVIRONMENTAL RESTORATION PROGRAM

S. L. Morton

Idaho National Engineering Laboratory
EG&G Idaho, Inc.
Idaho Falls, Idaho 83415

Prepared for the
U.S. Department of Energy
Office of Environmental Restoration and Waste Management
Under DOE Field Office, Idaho
Contract DE-AC07-76ID01570

Doc. No.: EGG-WM-9979
Section No. H&S Plan
Revision No. 3
Date November 1991
Page No. ii

HEALTH AND SAFETY PLAN
FOR
OPERATIONS PERFORMED FOR THE
ENVIRONMENTAL RESTORATION PROGRAM

Approved by:

S. G. Stiger, Manager
Environmental Restoration Program

Date

Reviewed by:

J. P. Shea, Chairman
ERP Independent Review Committee

Date

D. E. Minner, Occupational Medical Program

Date

DOE-ID approval letter for this Health and Safety Plan is attached to DRR number ERP-340, dated 6/21/91.

ABSTRACT

This document constitutes the generic health and safety plan for the Environmental Restoration Program (ERP). It addresses the health and safety requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 standard; and EG&G Idaho, Inc. This plan is a guide to individuals who must complete a health and safety plan for a task performed for the ERP. It contains a task specific addendum that, when completed, specifically addresses task specific health and safety issues. This health and safety plan reduces the time it takes to write a task specific health and safety plan by providing discussions of requirements, guidance on where specific information is located, and specific topics in the Addendum that must be discussed at a task level. This format encourages a complete task specific health and safety plan and a standard for all health and safety plans written for ERP.

Doc. No.: EGG-WM-9979
Section No. H&S Plan
Revision No. 3
Date November 1991
Page No. iv

CONTENTS

ABSTRACT	iii
ACRONYMS, ABBREVIATIONS, and DEFINITIONS	x
1. INTRODUCTION	1-1
1.1 H&S Plan Task Specific Addendum	1-2
1.2 Site Description	1-3
1.3 Scope of Work	1-4
2. HEALTH AND SAFETY RESPONSIBILITIES	2-1
2.1 Field Team Leader	2-1
2.2 Health and Safety Officer	2-4
2.3 Industrial Hygienist	2-5
2.4 Health Physics Technician	2-5
2.5 Radiological Engineer	2-6
2.6 Administrative Record and Document Control Office	2-7
2.7 Occupational Medical Program	2-7
2.8 Facility Representative	2-8
2.9 ERP Group Manager	2-9
2.10 Project Manager	2-9
2.11 Facility Manager	2-9
2.12 Environmental Hazardous Waste Engineer	2-10
2.13 Safety Engineer	2-10
2.14 Quality Engineer	2-10
2.15 Task Operations Personnel	2-11
2.16 Oversight Personnel and Visitors	2-11
3. PERSONNEL TRAINING	3-1

4.	MEDICAL SURVEILLANCE PROGRAM	4-1
5.	HAZARD EVALUATION	5-1
5.1	Chemical Agents	5-1
5.2	Fire and Explosion	5-2
5.3	Oxygen Deficiency	5-2
5.4	Radiological Hazards	5-3
5.5	Biological Hazards	5-4
5.6	Industrial Safety Hazards	5-4
5.6.1	Existing Objects or Terrain	5-5
5.6.2	Elevated Work Areas	5-5
5.6.3	Lifting Heavy Objects	5-6
5.6.4	Moving Machinery and Falling Objects	5-6
5.6.5	Personal Protective Equipment	5-6
5.6.6	Task Related Equipment	5-6
5.6.7	Excavation, Trenching, and Shoring	5-7
5.7	Electrical Hazards	5-7
5.8	Heat Stress	5-7
5.9	Cold Exposure	5-8
5.10	Noise	5-8
5.11	Decontamination	5-8
5.12	Work Stress	5-9
6.	LEVELS OF PROTECTION AND PERSONAL PROTECTIVE EQUIPMENT	6-1
6.1	Respiratory Protection	6-1
6.2	Level D Personal Protective Equipment	6-2
6.3	Level C Personal Protective Equipment	6-3
6.4	Level B Personal Protective Equipment	6-4
6.5	Level A Personal Protective Equipment	6-4

6.6	Personnel Protection in Radioactively Contaminated Areas	6-5
6.6.1	Zone I - Low Level Contamination	6-5
6.6.2	Zone II - Moderate Level Contamination	6-6
6.6.3	Zone III - High Level Contamination	6-6
7.	SAFE WORK PRACTICES	7-1
7.1	Working in Confined Spaces	7-1
7.2	Extended Working Schedules	7-1
7.3	Working in Heavy PPE	7-2
7.4	Working with Artificial Illumination	7-2
7.5	Buddy System	7-2
7.6	Handling Drums and Containers	7-2
7.7	ALARA Goals	7-3
7.8	Radioactive Spill Control	7-4
7.9	General Safe Work Practices	7-4
8.	WORK/RADIATION ZONES, SITE ENTRY, AND SECURITY	8-1
8.1	Work Zones	8-3
8.1.1	Exclusion Zone	8-3
8.1.2	Contamination Area	8-3
8.1.3	Contamination Reduction Corridor	8-3
8.1.4	Contamination Reduction Zone	8-3
8.1.5	Support Area	8-4
8.2	Radiological Control Zones	8-4
8.2.1	External Radiation Exposure Control	8-4
8.2.2	Radioactive Contamination Control	8-5
9.	ENVIRONMENTAL AND PERSONNEL MONITORING.....	9-1
9.1	Chemical Exposure Monitoring	9-2
9.2	Combustible Gas Monitoring	9-2

9.3	Radiological Monitoring	9-2
9.3.1	External Radiation Exposure Control	9-2
9.3.2	Radioactive Contamination Control	9-3
9.4	Heat and Cold Stress Control and Monitoring	9-3
9.5	Noise-Level Monitoring	9-6
9.6	Physical Hazard Control and Monitoring	9-6
9.7	Record Keeping Requirements	9-6
10.	DECONTAMINATION PROCEDURES	10-1
10.1	Modified Level A and B Decontamination Procedures	10-1
10.2	Modified Level C Decontamination Procedures	10-1
10.3	Radiological Decontamination	10-4
10.4	Equipment Decontamination and Disposal of Contaminated Materials	10-4
10.5	Decontamination During Medical Emergencies	10-8
11.	EMERGENCY PROCEDURES, EQUIPMENT, AND INFORMATION	11-1
11.1	Emergency Procedures	11-1
11.1.1	Personnel Occupational Injury or Illness in the Exclusion Zone	11-2
11.1.2	Personnel Occupational Injury or Illness in the Support Zone	11-2
11.1.3	Transportation and Followup of Injury	11-2
11.1.4	Fire/Explosion	11-2
11.1.5	Personal Protective Equipment Failure	11-3
11.1.6	Other Equipment Failure or Hazardous Material Spill	11-3
11.1.7	Hand Signals	11-4
11.1.8	Emergency Escape	11-4
11.1.9	Task Operations Shutdown	11-4
11.1.10	Task Site Reentry	11-5
11.2	Warning Devices	11-6
11.3	Emergency Equipment	11-6
12.	BIBLIOGRAPHY	12-1
ADDENDUM--HEALTH AND SAFETY PLAN FOR THE TEST AREA NORTH GROUNDWATER REMEDIAL INVESTIGATION/FEASIBILITY STUDY		A-1

FIGURES

1-1.	Map of INEL showing location of the major facilities	1-5
2-1.	Field organizational chart	2-2
8-1.	Diagram of typical hazardous material task site as recommended by NIOSH, 10/85	8-2
10-1.	Recommended modified Level A and B PPE hazardous chemical decontamination steps	10-2
10-2.	Recommended modified Level C PPE hazardous chemical decontamination steps	10-3
10-3.	Anti-c removal steps for radiological control Zone I	10-5
10-4.	Anti-c removal steps for radiological control Zone II	10-6
10-5.	Anti-c removal steps for radiological control Zone III	10-7

TABLE

3-1.	Training requirements and recommendations for ERP hazardous material workers	3-3
------	---	-----

ACRONYMS, ABBREVIATIONS, and DEFINITIONS

Acronyms:

ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
ARDC	Administrative Record and Document Control
anti-c	Anti-contamination
CA	Compliance Assurance
CERCLA	Comprehensive Environmental Response Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
COCA	Consent Order and Compliance Agreement
CPR	Cardiopulmonary Resuscitation
DOE	Department of Energy
DOE-ID	Department of Energy - Idaho Operations Office of DOE
DOP	Detailed Operating Procedure
DOT	Department of Transportation
DRD	Direct Reading Dosimeter
DRR	Document Revision Request
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
FTL	Field Team Leader
H&S	Health and Safety
HAZMAT	Hazardous Materials Response
HPT	Health Physics Technician
HSO	Health and Safety Officer
HW	Hazardous Waste
IAG	Interagency Agreement
IH	Industrial Hygienist
INEL	Idaho National Engineering Laboratory
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheets
NEPA	National Environmental Policy Act
NIOSH	National Institute for Occupational Safety and Health
NRTS	National Reactor Testing Station
OMP	Occupational Medical Program
OSHA	Occupational Safety and Health Administration
PD	Program Directive
PM	Project Manager
PPE	Personal Protective Equipment
QE	Quality Engineer
QPP	Quality Program Plan
QAPjP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RE	Radiological Engineer
SAP	Sampling and Analysis Plan
SCBA	Self-contained Breathing Apparatus
SE	Safety Engineer

SOP	Standard Operating Procedure
SSWP	Special Safe Work Permit
SWIMS	Solid Waste Information Management System
SWP	Safe Work Permit
TLD	Thermoluminescent Dosimeter
TRU	Transuranic
USCG	United States Coast Guard

Abbreviations:

NIOSH, 10/85--NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985.

Definitions:

Action Limit--Any physical, chemical, or radiological limit set by a regulatory agency, EG&G Idaho, Inc., or safety individual at the task site.

Area--A geographic subdivision of the INEL or a location outside the INEL dependent on the INEL for logistical or administrative support (e.g., TAN, TRA, CFA, IF).

Facility--The minimum complete and usable unit of Real Property designed to contain an organizational unit or operational function (e.g., building, central steam station).

Hazardous Material Response (HAZMAT) employee--Member of a group of employees, designated by management, who is expected to perform work to handle and control actual or potential leaks or spills of hazardous substances requiring possible close approach to the substance. The HAZMAT Team performs responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of an incident. A HAZMAT Team is not a fire brigade nor is a typical fire brigade a HAZMAT Team. A HAZMAT Team, however, may be a separate component of a fire brigade or fire department.

Task Site--Immediate working area where ERP task operations are being performed.

Doc. No.: EGG-WM-9979
Section No. H&S Plan
Revision No. 3
Date November 1991
Page No. xii

HEALTH AND SAFETY PLAN
FOR
OPERATIONS PERFORMED FOR THE
ENVIRONMENTAL RESTORATION PROGRAM

1. INTRODUCTION

This Health and Safety (H&S) Plan for operations performed for the EG&G Idaho, Inc. Environmental Restoration Program (ERP) establishes the procedures and provides general guidelines to minimize health and safety risks to the worker and public. This plan, in conjunction with associated task specific information required by this plan, shall be used during selected activities aimed at assessing and remediating past hazardous waste and/or hazardous substance disposal at the Idaho National Engineering Laboratory (INEL).

This H&S Plan and the associated task specific addendum required by this plan shall be in accordance with the Occupational Safety and Health Administration (OSHA), 29 CFR 1910.120 standard governing hazardous waste operations. It has been prepared in recognition of and is consistent with the NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985 (hereafter referenced as NIOSH, 10/85); the EG&G Idaho Company Procedures Manual; the EG&G Idaho Safety Manual; and the EG&G Idaho Radiological Controls Manual.

This H&S Plan shall be used when work is performed at ERP task investigation sites by employees of EG&G Idaho, subcontractors to EG&G Idaho and employees of other firms, and Department of Energy (DOE) Laboratories. Occasional visitors and oversight personnel [DOE, State of Idaho, and Environmental Protection Agency (EPA) representatives] are subject to the requirements of Section 2.16 of this plan.

1.1 H&S Plan Task Specific Addendum

This H&S Plan must address the many diverse conditions encountered for each task included in the ERP investigations. Therefore, an addendum shall be written for each task that requires an H&S Plan. The task addendum shall include any additions, omissions, or modifications to the main body of this H&S Plan that can individualize this plan into a task specific plan. The task specific plan need not repeat EG&G Idaho or ERP procedures for safety and health. However, these procedures shall be referenced in the Addendum.

NOTE: If an existing document meets the intent of the task specific plan [e.g., Detailed Operating Procedure (DOP)], it may be attached as the Addendum to this H&S Plan. The following statement must then be included at the beginning of the task specific addendum: "The information contained in this document contains all the elements required by the task specific addendum and therefore replaces the stated addendum." If an existing document is used for the addendum, it does not have to be in the specified format of the addendum. The task specific H&S Plan will be considered complete when the H&S Plan task addendum is reviewed and approved per ERP Program Directive (PD) 2.2.

Upon request, a copy of this generic H&S Plan and an electronic copy of the generic H&S Plan task specific addendum may be obtained from the ERP Administrative Record and Document Control Office (ARDC, 526-2650). At a minimum, the generic H&S Plan shall be reviewed annually and revised as required; therefore the requester shall verify the revision number of the generic H&S Plan with ARDC. The electronic copy of the task specific addendum is provided as a guide in producing a task specific H&S Plan. Pertinent topics referencing the main body of this H&S Plan are provided in the electronic copy of the blank H&S Plan task specific addendum to aid the author in writing a complete task specific H&S Plan.

When the electronic guide is used to produce a task specific addendum, each topic must be evaluated to determine how it applies to the specific task requiring the addendum. If the topic does not apply to the subject task, "N/A" shall be written in that portion of the task specific addendum. If additional information is required to make a complete task specific H&S Plan, additional blank pages may be added at the end of the task specific addendum. All technical information requested in the addendum must be obtained from knowledgeable individuals associated with the specific task [e.g., monitoring equipment information should be obtained from the task radiological engineer (RE) and/or industrial hygienist (IH)]. Once a task specific addendum is completed in accordance with ERP PD 4.4 and reviewed and approved in accordance with ERP PD 2.2, it shall be sent to ARDC, appended onto the generic H&S Plan and processed. ARDC is responsible for maintaining the electronic copy and originals of the task specific H&S Plans.

Any modifications to an approved task specific plan shall be implemented through a Document Revision Request (DRR), as described in ERP PD 4.1. If the change is made in an existing document used as a task specific plan but the document is not an ERP document, the changes will be made in accordance with the directives of the program/facility responsible for the document. Documentation of any changes made to documents external to ERP must be provided to ARDC.

1.2 Site Description

INEL is a multipurpose laboratory originally established in 1949 by the U.S. Government, under the direction of the Idaho Operations Office of the Department of Energy (DOE-ID). The primary mission of INEL is to support the engineering and operations efforts of DOE and other federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear defense materials production, waste management and technology development, and energy technology/conservation programs.

INEL, formerly the National Reactor Testing Station (NRTS), encompasses 890 square miles and is located approximately 20 miles west of Idaho Falls, Idaho (Figure 1-1). The United States Atomic Energy Commission, now DOE, established the NRTS in 1949 as a site for building and testing a variety of nuclear facilities. INEL has also been the storage facility of transuranic (TRU) radionuclides and low-level radioactive wastes since 1952. DOE-ID has responsibility for the INEL and designates authority to operate the INEL to government contractors. The primary contractor for DOE-ID at INEL is EG&G Idaho, Inc. which provides managing and operating services to the majority of INEL facilities. Other contractors who operate facilities at the INEL but are not covered by this H&S Plan include Westinghouse Idaho Nuclear Company, Argonne National Engineering Laboratory, Westinghouse Electric Corporation, and Rockwell Corporation.

Tasks being performed for the ERP are scattered throughout INEL, and detailed facility or task site descriptions are too numerous to include in this generic portion of the H&S Plan. Therefore, specific facility and/or task site descriptions shall be provided in the task specific addendum.

1.3 Scope of Work

ERP supports the following objectives identified in Chapter 2 of the Management Plan for the EG&G Idaho Environmental Restoration Program:

- Identify and remediate all past waste units presenting a potential threat to human health or the environment.
- Comply with the Consent Order and Compliance Agreement (COCA), which will be the integration document for INEL cleanup activities, by implementing the COCA Action Plan. Comply with the Interagency Agreement (IAG) when approved by DOE, Environmental Protection Agency (EPA) Region 10, and the State of Idaho.

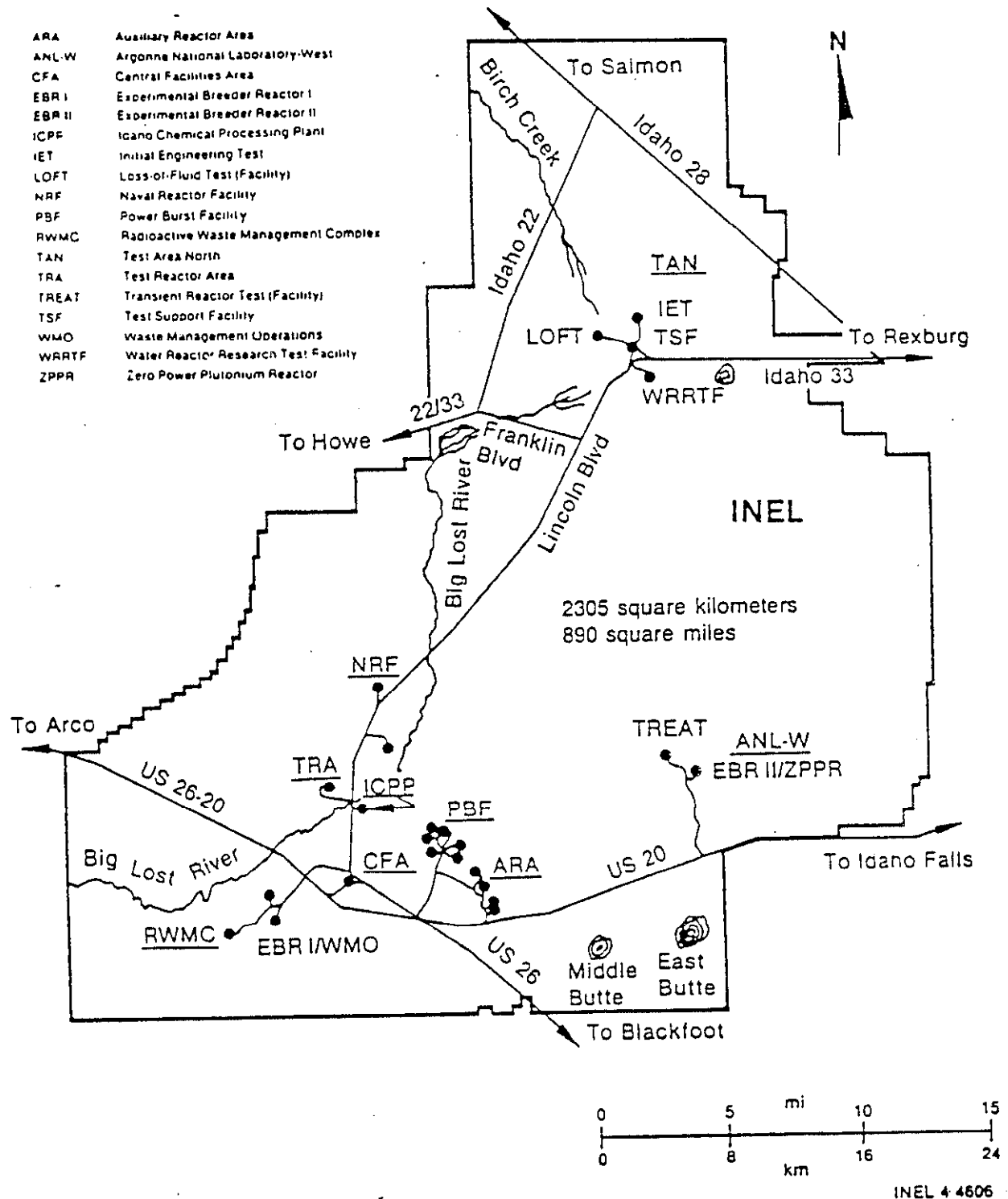


Figure 1-1. Map of INEL showing location of the major facilities.

- Comply with the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA) as established in an IAG among DOE-ID, EPA, and the State of Idaho.
- Support the DOE Environmental Restoration Program, as directed by DOE Headquarters in Washington, D.C.

A detailed work scope shall be included in the task specific addendum.

Field activities conducted during investigations may result in an exposure to hazardous and/or radioactive materials or wastes resulting from direct contact with contaminated soil, rock, groundwater, airborne particulates, and vapors. Protecting task site personnel from occupational health and safety hazards will be of major concern during the field activities. To this end, the ERP has identified a number of subjects that will provide protection to personnel and the environment. The following major subjects are addressed:

- Health and safety responsibilities
- Personnel training
- Medical surveillance program
- Hazard evaluation
- Levels of protection and use of personal protective equipment (PPE)
- Safe work practices
- Establishment of work zones, site entry, and security procedures

- Personnel and environmental monitoring and record keeping requirements
- Decontamination procedures
- Emergency procedures, equipment, and information.

Each subject is detailed in the following sections.

Doc. No.: EGG-WM-9979
Section No. H&S Plan
Revision No. 3
Date November 1991
Page No. 1-8

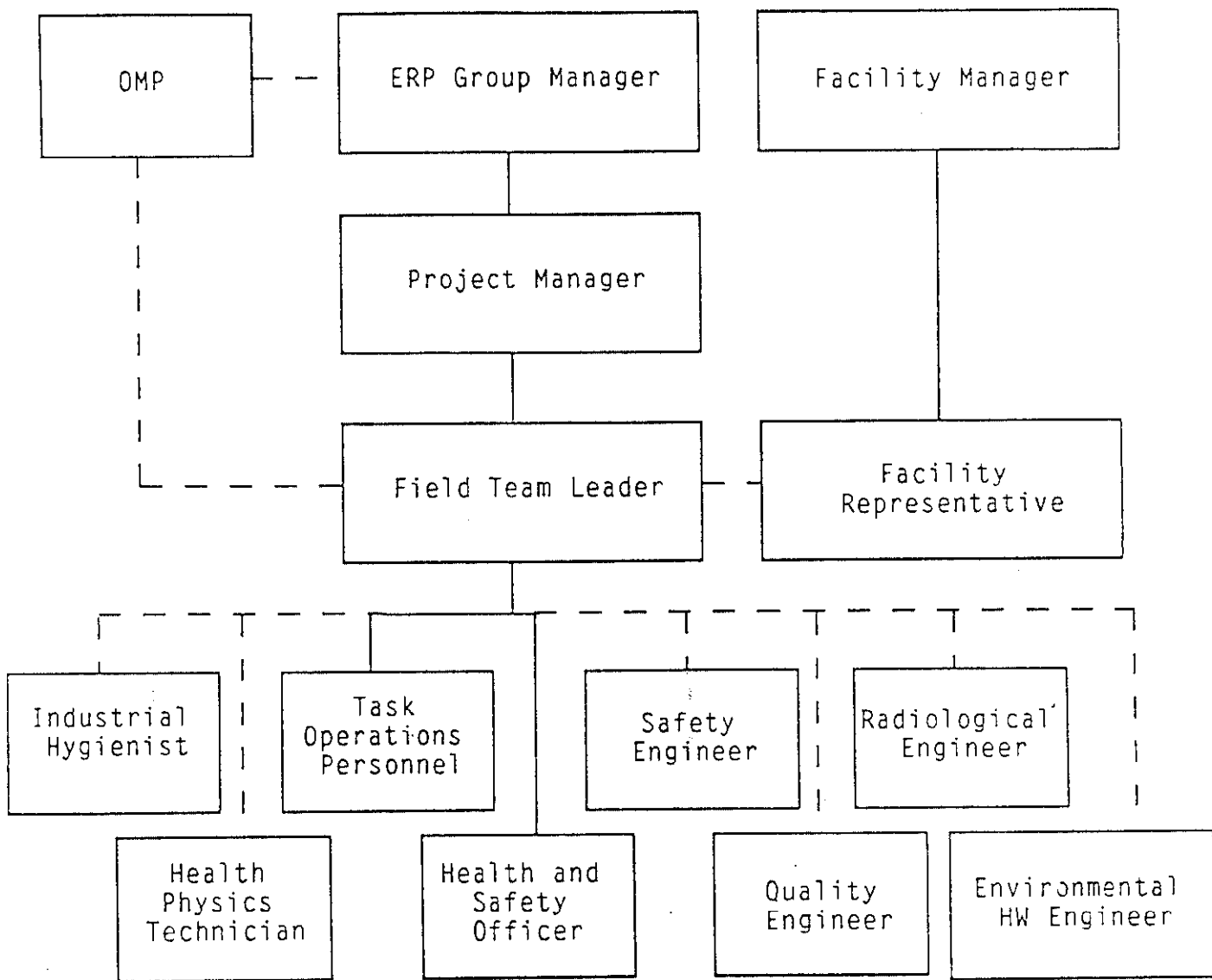
2. HEALTH AND SAFETY RESPONSIBILITIES

Direct implementation of the H&S Plan is the responsibility of the Field Team Leader (FTL). The FTL and/or Project Manager (PM) shall determine the task organizational structure and expertise required to perform the task while minimizing any risks to personnel health and safety. Expertise that may be required for the task includes but is not limited to industrial hygiene, health physics, industrial safety, and essential technical skills. The FTL shall develop a task organizational chart that identifies all key personnel. Both lines of command and lines of communication shall be identified by the task organizational chart (see Figure 2-1). The task organizational chart shall be located in the addendum. A qualified person may act in dual positions for a task [e.g., IH and health and safety officer (HSO)]. An HSO shall always be identified for a task per the requirements of OSHA 1910.120. The following subsections outline the responsibilities of the most common key personnel. If warranted by the requirements of the task, additional specialized positions may be necessary.

2.1 Field Team Leader

The FTL, the individual overseeing task activities, has ultimate responsibility for the safe and successful completion of task activities and for all phases of safety at the task site. If operations have been halted due to a potentially hazardous health and safety issue, the FTL will confer with the IH, HSO, RE, PM, health physics technician (HPT), safety engineer (SE), and facility representative, as required by the situation, to provide a safe solution to the problem. In addition, the FTL must remain responsive to health and safety issues raised by task operations personnel.

The FTL will ensure an orientation meeting is conducted before the start of a task to review and discuss operating procedures and the Task Specific H&S Plan (including any attachments) with task operations personnel. If new team



———— Lines of Responsibility
 - - - - - Lines of Communication

Figure 2-1. Field organizational chart.

members arrive at the task site after initiation of the task, the FTL shall ensure this orientation is presented to them.

At the beginning of each work day, the FTL (or alternate) will meet with task operations personnel to discuss the day's activities and address any health and safety issues that may have arisen or potentially could arise that day.

The FTL will ensure that all task operations personnel have received the appropriate training as required by Section 3 of this H&S Plan and that records of training for ERP personnel (including a copy of the signed Health and Safety Certification form as shown in the addendum) are submitted to the Training and Emergency Action Unit of the Waste Management Operations Support Group.

Additional responsibilities of the FTL include:

- Halting or modifying any task and/or evacuating the task site if work conditions are considered unsafe. This decision will be made after consulting with the HSO, IH, SE, and/or RE, as appropriate
- Reporting any accident, illness, or safety-related occurrence in accordance with Section 3 of the EG&G Idaho Safety Manual.
- Notifying the facility representative (if applicable) of any modifications or suspension of the task
- Ensuring that an interface exists with the analytical laboratories regarding any analyses of personnel monitoring and/or ambient air samples and provisions are made with the laboratory for a 24 to 48-hour turnaround for analysis in the event of an exposure suspected of being above an action level.

- Ensuring that all task site personnel understand and comply with all safety requirements
- Initiating corrective action for observed safety violations
- Ensuring that safety training is implemented as described in this plan (Section 3).

An FTL not at the task site must appoint an appropriate alternate to act as FTL. This change must be communicated to the facility representative, when necessary, and recorded in the FTL logbook. Appropriate alternates shall be listed in the task specific addendum.

2.2 Health and Safety Officer

The HSO is responsible for ensuring compliance with and the execution of the health and safety procedures described in this plan and the associated task specific addendum. The HSO will be supported by those personnel necessary to effectively implement the task specific H&S Plan and verify compliance (e.g., SE, IH, HPT, RE, and facility representative).

Responsibilities of the HSO include:

- Ensuring that all necessary safety equipment is located on or near the task site and properly maintained and calibrated by the appropriate personnel.
- Observing task site activities and reporting any deviations from the H&S Plan to the FTL
- Initiating contact with the INEL emergency response agencies (security, fire, medical) at the beginning of the task, ensuring personnel and environmental monitoring requirements are established

by the IH and RE (Section 9), and testing the emergency phone numbers to ensure accuracy.

2.3 Industrial Hygienist

The IH is the primary source of information regarding health issues at the task site. The IH is responsible for operations and maintenance of all monitoring equipment with the exception of radiological equipment and will maintain a daily logbook of monitoring activities. The IH will conduct task site health hazard assessments and advise the FTL on adequate health protection for task operations personnel. The IH will advise the FTL on changes to monitoring or PPE requirements throughout task activities and on any conditions necessitating task site evacuation and permitting personnel reentry to the task site.

The IH is responsible for designing a practical monitoring program to determine worker exposures to hazardous substances. The IH will also log results from field samples and observations.

NOTE: Much uncertainty is involved as to the chemical hazards that may be encountered. Not everything can be monitored, and professional judgment must be exercised at all times.

The IH shall aid the FTL in identifying employees experiencing adverse health effects that may have resulted from exposure to hazardous substances and environments and identifying such workers to the Occupational Medical Program (OMP).

2.4 Health Physics Technician

The HPT is the primary source of information and guidance with regards to radiological hazards. The HPT will be present at the task site before

operations begin and at any point during task operations when a radiological hazard to operations personnel may exist or is anticipated.

Responsibilities of the HPT include:

- Ensuring radiological equipment is calibrated and functioning properly
- Radiological surveying of the task site, equipment (before and after decontamination), and samples
- Collecting and analyzing smears
- Providing guidance and monitoring decontamination of equipment (radiological contaminants)
- Providing the FTL, OMP, and RE with radiological monitoring information as requested
- Immediately notifying the FTL of any radiological occurrence that must be reported as directed by the EG&G Idaho Safety Manual, Section 3, Appendix II.
- Accompanying victim to the nearest INEL Medical Facility for evaluation if significant radiological contamination occurs.

2.5 Radiological Engineer

The RE is the primary source of information and guidance for radiological controls imposed on a task. The RE will make recommendations to minimize health and safety risks of task operations personnel if a radiological hazard exists or occurs at a task site.

The responsibilities of the RE include:

- Performing radiation exposure estimates using information provided by cognizant engineers, area HPTs, history of past work evaluations, bioassays, FTLs, etc.
- Identifying the type(s) of radiological monitoring equipment necessary to maintain safe working conditions for task operations personnel
- Attending pre-job briefings if required by the FTL
- Advising FTL and HPT of changes in monitoring or PPE and task site evacuation and reentry.

2.6 Administrative Record and Document Control Office

The ARDC is responsible for organizing and maintaining data and reports (safety, sampling, and operations) generated by ERP investigations. ARDC maintains a supply of all controlled documents and provides a documented checkout system for the control and release of controlled documents, reports, and records. A copy of the H&S Plan and the associated electronic copy of the task specific addendum are available upon request by calling 526-2650.

2.7 Occupational Medical Program

The OMP is mandated by DOE 5480.8 and uses the sciences related to preventive medicine and environmental health to determine the effects of environmental stress on human health or disease.

The OMP has responsibilities in the following areas:

- Review and comment on INEL emergency plans and operations

- Provide diagnosis, medical opinion, and treatment for INEL employees with occupational or nonoccupational illness or injuries
- Assist in the documentation and investigation of work-related illnesses or injuries
- Provide medical opinion whenever there is doubt by the FTL, advisors, or employee of the ability of the employee to perform assigned work or work being considered for assignment
- Plan and provide emergency medical care in support of individuals and Area emergency actions
- Maintain and operate a radiation and chemical decontamination facility at Central Facilities Area (CFA)
- Provide medical surveillance of workers who are identified by an IH as having been or are likely to be exposed over action levels to specific hazardous environments or substances.

2.8 Facility Representative

The facility representative serves as the Area Landlord representative and is responsible for the safety of personnel and safe completion of all project activities conducted within his/her Area. Therefore, the facility representative will be kept informed of all activities performed in the Area. Where applicable, the facility representative and FTL shall agree upon a schedule for reporting task progress and plans for work. The facility representative will serve as advisor to task operations personnel with regard to the Area operations when the task is performed in his/her Area.

2.9 ERP Group Manager

The ERP Group Manager is responsible for investigation and remediation activities performed by ERP. This manager provides technical coordination and interfaces with the DOE-ID Environmental Support Office. The ERP Group Manager ensures that all activities are conducted in accordance with DOE, EPA, and State of Idaho requirements and agreements; monitors and approves program budgets and schedules; ensures the availability of necessary personnel, equipment, subcontractors, and services; and provides direction for the development of tasks, evaluation of findings, development of conclusions and recommendations, and production of reports. The ERP Group Manager has primary responsibility for the technical quality of all projects and safety of personnel.

2.10 Project Manager

The PM has the responsibility for ensuring that all tasks conducted during the project are in compliance with the Management Plan for the EG&G Idaho Environmental Restoration Program and all applicable OSHA, EPA, DOE, Department of Transportation (DOT), and State of Idaho requirements. The PM is responsible for ensuring tasks comply with the ERP Quality Program Plan (QPP) (QPP-149), Quality Assurance Project Plan (QAPjP), H&S Plan, PDs, and Sampling and Analysis Plans (SAPs) of ERP. The PM coordinates all field, laboratory, and modeling activities.

2.11 Facility Manager

The Facility Manager is responsible for managing all aspects of the Area in his charge. The Facility Manager must be cognizant of work being conducted in the Area.

2.12 Environmental Hazardous Waste Engineer

The Environmental Hazardous Waste (HW) Engineer oversees, monitors, and advises EG&G Idaho organizations performing field activities at the INEL. Responsibilities include ensuring compliance with DOE Orders, EPA regulations, and other regulations concerning effects of activities on the environment. Additional responsibilities of the HW Engineer include:

- Acting as advisor for environmental concerns associated with ERP task activities
- Maintaining a library of applicable environmental information
- Disseminating applicable environmental information where/when needed.

2.13 Safety Engineer

The SE offers guidance on all safety issues arising at the task site, observes tasks and advises the FTL on required safety equipment necessary to promote a safe work environment, advises FTL and HSO about safety concerns arising during task operations, and recommends solutions to any concerns.

2.14 Quality Engineer

The Quality Engineer (QE) provides guidance on task site quality issues when requested. The QE observes task site activities and verifies that task operations comply with quality requirements pertaining to these activities. The QE identifies activities that do not or have the potential for not complying with quality requirements and suggests corrective actions for such activities.

2.15 Task Operations Personnel

All task operations personnel, including EG&G and subcontractor personnel, are responsible for understanding and complying with requirements of the task specific H&S Plan. Task operations personnel will be briefed by the FTL before starting each day's activities. They should identify and discuss potentially unsafe task site activities or conditions with the FTL for corrective action. If unsafe conditions develop, task operations personnel are authorized to halt work and notify the FTL of the unsafe condition.

2.16 Oversight Personnel and Visitors

Oversight personnel (i.e., DOE-ID, EPA, and State of Idaho representative) and visitors shall be considered "workers on site only occasionally." To minimize risks that may result from task site activities, "workers on site only occasionally" must have official business and notify the FTL before entering the task site. All "workers on site only occasionally" shall follow the requirements of OSHA 1910.120(d)(3)(ii) which states:

Workers on site only occasionally for a specific limited task (such as, but not limited to, groundwater monitoring, land surveying, or geo-physical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

If these individuals meet the requirements stated above, they may not proceed beyond the support zone without receiving a safety briefing and wearing the appropriate protective equipment.

Doc. No.: EGG-WM-9979
Section No. H&S Plan
Revision No. 3
Date November 1991
Page No. 2-12

3. PERSONNEL TRAINING

Task operations personnel classified by the PM and/or FTL as hazardous material workers shall receive hazardous material worker training as specified by OSHA 29 CFR 1910.120 and the EG&G Idaho Safety Manual, Section 8. Specific training requirements for each hazardous material worker may vary depending on the hazards associated with the job assignment (e.g., noise, radiation). All hazardous material workers must obtain OSHA Hazardous Waste Operator training. Additional training to be considered for hazardous material workers includes but is not limited to:

- Respirator Fit Test Qualification
- Radiation Worker
- Hearing Conservation.

In addition to the above mentioned training, at least one worker with Medic 1st [Cardiopulmonary Resuscitation (CPR) and First Aid] training shall be present at the task site when task operations personnel are present. Managers of hazardous material workers (e.g., PM, FTL) shall obtain Hazardous Waste Worker Supervisor Training. Additional safety training courses may be required as dictated by the job assignment. Section 8 of the EG&G Idaho Safety Manual contains course numbers and descriptions for all EG&G safety training courses.

Employees who attend training classes requiring an annual refresher course must attend the annual courses for as long as they remain active hazardous material workers. Proof of completion of all required training courses by employees and visitors must be provided to the Training and Emergency Action Unit of the Waste Management Operations Support Group. ERP personnel can also obtain information regarding ERP personnel training records

(e.g., due dates of refresher courses) from the Training and Emergency Action Unit of the Waste Management Operations Support Group.

The FTL will ensure that all task operations personnel understand the specific site hazards associated with each task at the daily briefings. Each FTL will also design and ensure implementation of a task specific training orientation to inform task operations personnel about the unique hazards or procedures, task specific H&S Plan, DOPs, etc. associated with the task at hand. Table 3-1 summarizes the above mentioned training requirements.

The following outline shall be used as a guideline for training and orientation before the start of a task. Personnel working at the task site shall be informed of the information listed in this outline, as applicable to the specific task.

A. WORK PLAN (SAP, Test Plan, etc.)

B. HEALTH AND SAFETY ITEMS

1. Personnel responsibilities
2. Medical program
3. Task site work zones
4. Vehicle operation and parking
5. Task site air and radiological monitoring
 - a. Monitoring equipment (task site and personal)
 - b. Calibration
 - c. Maintenance and decontamination procedures

TABLE 3-1. Training topics for ERP hazardous material workers^a

<u>Training Topic^b</u>	<u>Personnel Job Description</u>	<u>Task Operations Personnel</u>	<u>Field Managers</u>
OSHA Hazardous Waste Operator	Cleanup or operations of hazardous waste sites	R	R
Respirator Fit Test Qualification	Work area requires use of respirator	R	R
Radiation Worker	Level of radiation exposure determines training category	R	R
Medic 1st	First Aid, CPR	R*	O
Personal Protective Clothing and Equipment	Required to wear Chemical and/or Radiological	R	R
Site Specific Hazards (FTL develops this training)	Encounters task specific potential hazards	R	Develop
Decontamination	Chemical and/or Radiological Procedures	R	R
Hearing Conservation	IH determines exposure to noise above 8-hour time-weighted average of 85 decibels	R	R
Emergency Training	Knowledge of Area drills, rescue, response, information	R	R

R: Required

O: Optional

*: At least one worker with Medic 1st Training shall be at task site when task operations personnel are present.

a. Additional training may be required for each task or individual and should be listed in the addendum.

b. These training topics include both the initial and refresher training (See EG&G Idaho Safety Manual, Section 8 for specific safety training course descriptions and numbers).

B. HEALTH AND SAFETY ITEMS (continued)

6. Potential hazardous contaminants and chemical hazards (toxicity and symptoms) present at the task site
7. Potential radiological contaminants
- | 8. Task Specific Hazard Communication (in addition to the General
| Hazard Communication) training
 - a. Inventory of hazardous agents
 - b. Material Safety Data Sheets (MSDSs)
 - c. Container labeling
 - d. Informing visitors
 - e. Contractor inventory and MSDSs
9. Contingency plans and responses
 - a. Spill control
 - b. Work stoppage
10. Use of field equipment and supplies
 - a. Drilling equipment
 - b. Work tools
 - c. Sampling equipment
 - d. Decontamination of equipment and supplies
11. Task site control and security
12. Buddy system and hand signals

B. HEALTH AND SAFETY ITEMS (continued)

13. Work limitations

- a. Weather
- b. Fatigue
- c. Heat stress
- d. Cold stress
- e. Hours of work
- f. Illumination
- g. Lightning

C. PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING

1. General

2. Availability

3. Level D PPE and clothing, as defined by OSHA, including limitations of protection

- a. Work clothing
- b. Eye protection
- c. Foot protection
- d. Head protection
- e. Hearing protection

4. Level C PPE and clothing, as defined by OSHA, including limitations of protection

- a. Respiratory protection
- b. Work clothing
- c. Eye protection

C. PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING (continued)

- d. Foot protection
 - e. Head protection
 - f. Hearing protection
 - g. Skin/hand protection
5. Level B PPE and clothing, as defined by OSHA, including limitations of protection
- a. Air supplied hood or self-contained breathing apparatus (SCBA)
 - b. Disposable, chemically resistant coveralls
 - c. Anti-contamination (anti-c) clothing as recommended by the RE
 - d. Chemically resistant safety shoes with steel toe
 - e. Chemically resistant shoe covers
 - f. Hard hat
 - g. Inner and outer chemically resistant gloves
 - h. Hearing protection, as required by IH
6. Level A PPE and clothing, as defined by OSHA, including limitations of protection
- a. SCBA
 - b. Fully encapsulating, chemically resistant suit
 - c. Additional anti-c clothing, as recommended by the RE
 - d. Chemically resistant safety shoes with steel toe
 - e. Chemically resistant shoe covers
 - f. Hard hat
 - g. Inner chemically resistant gloves
 - h. Hearing protection, as required by IH

C. PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING (continued)

7. Zone I anti-c clothing minimum requirements

- a. One pair cloth anti-c coveralls (or disposable) (as required by HPT)
- b. One yellow cloth hood (or disposable)
- c. Two pair shoe covers
- d. One pair latex gloves and cloth glove liners

8. Zone II anti-c clothing minimum requirements

- a. One pair yellow cloth anti-c coveralls (or disposable)
- b. One yellow cloth hood (or disposable)
- c. Three pairs shoe covers (two pairs must be vinyl)
- d. One pair latex gloves and cloth glove liners

9. Zone III anti-c clothing minimum requirements

- a. One pair yellow cloth anti-c coveralls and head cover (hood)
- b. One pair disposable anti-c coveralls (or plastic anti-c suit) with disposable hood
- c. Three pairs shoe covers (two pairs must be vinyl)
- d. Two pairs gloves and cloth glove liners
- e. Respiratory protection commensurate with the contamination levels

10. Decontamination procedures

- a. Chemical contaminants
- b. Radiological contaminants
- c. Mixed contaminants

D. EMERGENCY ASSISTANCE

1. Availability of emergency services and location of telephone and telephone numbers, MSDSs, and other emergency information
2. Transportation of emergency cases and accompanying medical monitoring procedures
3. Emergency assistance and review of hand and audible signals

E. SPECIAL PRECAUTIONS DURING TASK SPECIFIC OPERATIONS

1. Most dangerous times
2. Most dangerous conditions
3. Specific task checklist.

In addition, the FTL will conduct safety briefings (a) at the beginning of each shift, (b) whenever new personnel arrive at the task site, and (c) as significant changes to task site or work conditions occur.

4. MEDICAL SURVEILLANCE PROGRAM

Employees identified as hazardous waste workers as defined by OSHA (29 CFR 1910.120) require medical surveillance examinations prior to beginning duties, annually, and at the termination of hazardous waste duties (if they have not had such an examination within a year). This includes (a) employees who are or who may be exposed to hazardous substances at or above established permissible exposure limits, without regard to respirator use, for 30 or more days per year; (b) those who wear a respirator for 30 or more days per year; and (c) all HAZMAT employees. In addition, employees who must use a respirator in their job or are required to take training to use a respirator to perform their duties under this plan must be medically evaluated for respirator use at least annually.

The OMP is responsible for evaluating the physical ability of a worker to perform the task assigned. The OMP provides medical clearance to the worker for the work to be performed. The OMP may impose restrictions on the employee by limiting the amount or type of work performed. The PM (or the IH and/or HP with the approval of PM) must provide the job related background information listed below to the OMP for each hazardous material worker. This information must be submitted to the OMP before work begins and annually, one month before birth date of the employee to maintain hazardous waste/hazardous material worker medical clearance. It may be submitted on EG&G Form 3044, "Hazardous Material Worker Job Related Background Information;" EG&G Form 735, "Industrial Hygiene Identification Of An Employee For A Medical Surveillance Program To OMP;" or by other means acceptable to the OMP.

- Medical history and physical examination
 - Preemployment medical examination, for full-time employees
 - Current comprehensive medical examinations, for full-time employees, in an INEL medical facility

- Records and reports from employees' private physicians, as required by the Site Occupational Medical Director
- Medical evaluation by OMP on return to work following an absence in excess of one work week (40 consecutive work hours) resulting from illness or injury
- Medical evaluation in the event a supervisor questions the physical condition of an employee
- Medical evaluation in the event the employee questions his/her physical condition
- Job related background information (Form EG&G-3044)
 - What type of job does the individual perform?
 - When was the individual first exposed to hazardous substances or working in an environment with potential hazardous exposure at the INEL?
 - Relevant environmental monitoring (IH and HPT) data including sample dates and places (if the employee has been exposed to substances or physical agents above an action level)
 - How and when was/will the employee (be) trained in PPE including respirators?
 - What type of respiratory protective device is to be used?
 - How many days per month is respiratory protection to be used?
 - How long is this work to continue?

The above information and examinations are used to determine the following for each employee:

- Ability to perform routine occupational tasks
- Work in protective equipment and/or heat stress environments
- Use of respiratory protection
- Need to be entered into additional specific medical surveillance examination programs.

Employees are cleared as hazardous material workers with or without specific restrictions relating to heat stress, certain job tasks, and/or use of respirators. If the OMP does not have sufficient information at the time of request for clearance for respirator training, the supervisor is notified and clearance is withheld until the needed information is provided and any necessary additional examination or testing is completed.

Results of the following tests shall be made available to the OMP when any abnormal exposure is noted or a radiological contamination incident occurs:

- Whole body count (baseline, annual, and on actual or suspected radiological contamination incident)
- Bioassay (baseline, as required to assess internal radiation dose, and on actual or suspected radiological contamination incident).

Subcontractors are responsible for being in compliance with health and safety requirements as stated in 29 CFR 1910.120. All medical data collected pursuant to hazardous material worker qualification of a subcontractor worker shall be made available to the OMP. Background information about the

subcontractor worker will assist the OMP in assessing the medical ability of the subcontractor worker to work should doubt arise during task operations.

This information is also required from the subcontractor in order for the OMP to clear the subcontractor worker as a hazardous material worker.

Subcontractor past radiation exposure history shall be submitted to the Operational Dosimetry Unit of EG&G Idaho (Section 3.5 of Chapter 2 in the Radiological Controls Manual).

It is the policy of the OMP to examine all workers, including subcontractors, when they are injured on the job or there is reason to believe that they have been exposed, over an action level, to toxic substances or physical agents.

Before initiation of any task where a chemical/radiological hazard exists, the appropriate medical facility will be notified of the start of the task, anticipated schedules, and task site locations by the HSO. In addition, the OMP shall be supplied with an inventory of the known hazardous constituents located at the task sites.

In the event of an IH and/or RE documented exposure to a hazardous substance or physical agent over an action level, the worker(s) shall be transported to the nearest medical facility for evaluation. Further medical evaluation will be in accordance with the symptoms, specific hazard involved, exposure level, medical surveillance requirements, current health and safety directives, and sound medical practices.

The following information shall be provided to the OMP:

- Name, job title, work location, supervisor's name, and supervisor's phone number
- Substances/physical agents (e.g., noise) involved

- Date the employee was first exposed to the substance/physical agent on this task
- Monitoring data including locations of samples and dates samples were taken, if exposed over action level
- PPE in use during this task
- Number of days per month PPE has been in use
- How long this employee will be exposed to the substance or physical agent
- Training the employee has received in the use of PPE
- Type of respirator, if any, being used.

Doc. No.: EGG-WM-9979
Section No. H&S Plan
Revision No. 3
Date November 1991
Page No. 4-6

5. HAZARD EVALUATION

Personnel may be exposed to a variety of substances and physical agents while working at the task site. Exposures may be a result of contacting materials stored, handled, or disposed; equipment being used; weather conditions or time of day; environmental surroundings; and/or task specific working conditions. The FTL should asterisk all suspected hazardous materials pertinent to the task on the list provided in the task specific addendum. Any additional stress agents should also be listed in the task specific addendum. A job hazard analysis using EG&G Idaho Company Procedure, Number 11.9 shall be used as appropriate to perform portions of the task site hazard evaluation. All personnel working at a task site should be aware of existing hazards.

The following sections provide general information on the types of potential exposures that may be encountered while working at task sites.

5.1 Chemical Agents

Exposure to chemical agents may result when personnel come in contact with gaseous, liquid, or solid materials encountered at the investigation sites. Personnel shall make every effort to avoid direct contact with disposed or hazardous materials. Task operations personnel may be exposed to contamination through inhalation, ingestion, absorption (skin/eye), and injection (puncture wound).

- Inhalation of hazardous materials can occur due to lack or improper use of respiratory equipment, malfunctioning monitoring equipment, presence of undetected chemicals, or chemicals in quantities greater than the respiratory equipment protection limits.
- Digestive system may be affected by hazardous substances when workers do not practice good personal hygiene habits (e.g., washing hands thoroughly after completion of work and before smoking,

eating, drinking, and chewing gum or tobacco). Inhaling or swallowing airborne hazardous substances may also produce adverse effects to the digestive system.

- Skin absorption of solid, liquid, or gaseous hazardous substances can occur through cuts or abrasions. Skin absorption can occur when a worker does not wear proper protective clothing or when a breach of protective clothing has occurred.
- Eye irritation may develop from solid, liquid, gaseous contaminants. This irritation may occur when a worker does not wear proper eye protection or when unwashed hands come in contact with the eyes.
- Hazardous substances may be injected into the body through puncture wounds occurring from contaminated equipment with sharp edges or protrusions.

5.2 Fire and Explosion

Explosions and fires may occur as a result of activities such as moving drums, accidentally mixing incompatible chemicals, introducing an ignition source into an explosive or flammable environment, or refueling equipment. Intense heat, open flame, smoke inhalation, flying objects, and the release of toxic chemicals into the environment can result.

5.3 Oxygen Deficiency

Oxygen deficiency can result from the displacement of oxygen by another gas or the consumption of oxygen by a chemical reaction. Confined spaces or low-lying areas such as pits or trenches are particularly susceptible to oxygen deficiency. The EG&G Idaho Safety Manual, Section 20 Appendix A and

the EG&G Idaho Company Procedures Manual, Number 11.3, should be reviewed by those working in a confined space.

5.4 Radiological Hazards

The potential exists for radiation exposure and radiological contamination to task operations personnel. Contamination is the presence of uncontained radioactive material on any object or surface or in the atmosphere, especially where the presence of radioactive material may be harmful or could be spread if disturbed by an outside agent.

Types of contamination are discussed below.

- Loose contamination is easily spread to adjacent areas and can be ingested or inhaled.
- Fixed contamination is the presence of uncontained radioactive material on surfaces which cannot be easily removed by normal decontamination techniques.
- Airborne contamination is normally in particulate form and is of concern because it can be ingested or inhaled. When inhaled, airborne particulate can deposit in the lungs and diffuse to other parts of the anatomy causing an internal exposure hazard (respiratory protection must be worn when entering an airborne contamination area.)

Contamination may enter the body through

- Absorption
- Injection
- Ingestion
- Inhalation.

| Radiation is energy emitted from a source that travels in
| electromagnetic waves or very small particles at various speeds or energies.
| Ionizing radiation is energy emitted from an unstable atom in the form of
| particles (alpha, beta, neutron) and/or electromagnetic wave or photons (gamma
| and x-ray) which has enough energy to interact with other atoms and change
| their charge. Personnel may be irradiated without contamination but cannot be
| contaminated without being irradiated.

5.5 Biological Hazards

Waste from research facilities, garbage, and animal feces may contain disease-causing organisms. If these agents are present, they could infect task operations personnel and be dispersed in the environment by water and wind. It is recommended (not required) that operations personnel be immunized against tetanus bacteria, which live in the soil, to minimize the effects of possible exposure.

Encounters with wildlife may be possible at the task site. Snakes, insects, and other animals can and will bite if disturbed and avoidance is the best solution. Prompt first aid should be performed if this type of injury occurs.

5.6 Industrial Safety Hazards

Numerous unsafe conditions or actions may be encountered. These may include:

- Existing objects and terrain
- Elevated work areas
- Lifting heavy objects
- Moving machinery and falling objects
- Personal protective equipment

- Task related equipment
- Excavation, trenching, and shoring.

Task operations personnel should look for potential hazards and immediately inform the FTL of those hazards so that action can be taken to minimize injury due to an unsafe condition or action.

5.6.1 Existing Objects or Terrain

Existing objects and terrain can present safety hazards such as:

- Holes and ditches
- Precariously positioned objects (e.g., drums or boards that may fall)
- Sharp objects (e.g., nails, metal shards, and broken glass)
- Slippery surfaces
- Overhead power lines
- Steep grades
- Uneven terrain
- Unstable surfaces (e.g., walls that may collapse or flooring that may give way)
- Ladders/stairs.

Additional safety hazards introduced by the task should be listed in the task specific addendum.

5.6.2 Elevated Work Areas

During the course of task activities, personnel may be required to work on elevated equipment. When such work must be performed, the provisions stated in Section 16 of the EG&G Idaho Safety Manual shall be followed. In addition, personnel required to work under these conditions shall be trained on the use of elevated equipment.

5.6.3 Lifting Heavy Objects

Operations personnel may risk injury by lifting heavy objects. All operations personnel should be trained in the proper method of lifting heavy equipment and cautioned against lifting objects that are too heavy. Mechanical and hydraulic assists will be used whenever possible to minimize lifting dangers.

5.6.4 Moving Machinery and Falling Objects

Task operations personnel may be subject to lacerations and contusions (cuts and bruises) when activity involves contact with moving machinery and falling objects. Injury can be minimized by wearing protective clothing, hard hats, steel-toed boots, and using mechanical assists whenever possible. Loose clothing or neck chains for security badges should not be worn and hair should be secured when personnel work around equipment with moving parts or any other potentially hazardous piece of equipment. All moving and rotating machinery must be properly guarded and guarding must remain in place.

5.6.5 Personal Protective Equipment

Wearing PPE may reduce a worker's ability to move freely, see clearly, and hear directions and noise that might indicate a hazard. Also, PPE can increase the risk of heat stress. Personnel must adjust their work activities to accommodate limitations.

5.6.6 Task Related Equipment

Hazardous equipment and/or situations not mentioned above shall be listed in the task specific addendum. The FTL shall make all personnel aware of possible dangers associated with use of hazardous equipment and/or situations.

5.6.7 Excavation, Trenching, and Shoring

Work at hazardous waste sites may involve excavations for purposes of positioning equipment, removal of contaminated soils, removal of underground tanks, or retrieval of containers such as drums, piping systems, or other buried materials. Tasks which involve work in any excavation present serious potential hazards to personnel; personnel protective systems, barricades, signs, and daily inspections are some of the safeguards required for excavation work. For more detail, see the OSHA requirements outlined in 29 CFR 1926, Subpart P - Excavations. In addition, EG&G Idaho Safety Manual Section 20.0, Appendix B, contains additional requirements which may be more restrictive than those of the OSHA standard.

5.7 Electrical Hazards

Overhead power lines, downed electrical wires, and buried cables all pose the danger of shock or electrocution of workers. Electrical equipment may also pose a hazard to workers. Careful observation for overhead electrical hazards will be performed by operating personnel before raising masts on drill rigs or using cranes. Underground utility clearances must be obtained before drilling or excavating operations by contacting Telecommunications (526-1591/526-2512). The EG&G Idaho Safety Manual, Supplement 2.2 "Safe Work Permits (SWPs)/Special Safe Work Permits (SSWPs)," and Section 10, "Electrical Safety," shall be followed for all work performed near overhead electric lines and electrical work.

5.8 Heat Stress

Workers may be required to wear protective clothing that could prevent the body from cooling naturally, thus causing a rise in body temperature. High body temperatures can result in heat fatigue, physical discomfort, and death. The IH must inform the FTL of signs and symptoms of heat stress to preserve safe work conditions at the task site. Work scheduled for summer

months is subject to higher ambient temperatures than in winter. Radiant heat can create a hazard in the summer. EG&G Idaho Company Procedures Manual, Number 11.10 discusses the hazards of heat stress.

5.9 Cold Exposure

Exposure to low temperatures may be a factor if work is done in the evening hours, if winds are high, if unpredictable weather moves in, and in the winter months (e.g., at 50°F, with a 25 mph wind, the equivalent chill temperature is 32°F). EG&G Idaho Company Procedures Manual, Number 11.10 discusses the hazards of cold stress.

5.10 Noise

Task operations personnel may be exposed to high levels of noise generated by heavy equipment and other sources.

5.11 Decontamination

The chemical and radiological decontamination processes for tools, equipment, clothing, and personnel to remove contaminant generated by the task site activities have the potential for spreading contamination and increasing the exposure to personnel if care is not exercised when decontamination activities are taking place. High pressure hot water and steam used in the process can present a hazard if blasts of either agent rebound into the face or onto the body. In addition, airborne contaminants may result from this process. Decontamination procedures shall be followed and appropriate personal protection shall be used during decontamination activities. Good housekeeping measures will be followed, so that decontamination liquids do not present a hazard.

5.12 Work Stress

Hazardous activities that rely on a high degree of personal alertness shall be performed under controlled conditions of job performance as outlined in Section 20 of the EG&G Idaho Safety Manual. The FTL assumes responsibility of good judgment in the assignment of personnel fatigued by excessive hours of work in psychologically and possibly physiologically stressful environments.

Doc. No.: EGG-WM-9979
Section No. H&S Plan
Revision No. 3
Date November 1991
Page No. 5-10

6. LEVELS OF PROTECTION AND PERSONAL PROTECTIVE EQUIPMENT

Selection of PPE is based on the recommendations contained in NIOSH, 10/85. Each work location will be evaluated for potentially hazardous contaminants by the SE, IH, and HPT before entry. Due to the types of known contaminants and the likelihood of unknown contaminants being present, several recommended levels of PPE are described in this section. The levels are Level A, Level B, Level C, and Level D. Radiological control levels include Zone I, Zone II, and Zone III. The required level for PPE will depend on the IH and RE task site hazard assessment, physical conditions, and monitoring data. The level of PPE used at the task site shall be specified by the IH and RE. Changes in PPE level shall be documented in the FTL logbook.

Without compromising the protection from chemical and radiological exposure, and considering the comfort of the workers, Level B and Level C clothing may be modified as stated in Chapter 8 of the referenced NIOSH, 10/85. That decision will be made by the IH and HPT and documented by the FTL in the task specific addendum.

6.1 Respiratory Protection

All personnel shall wear only those respirators for which they have been trained and acceptably fit-tested. Respirators shall be used under the recommendation of the IH and HPT. Also, guidelines for respirator use, emergency use, storage, cleaning, and maintenance, as stated in EG&G Idaho Company Procedures Manual, Number 11.1, shall be followed.

Inspection procedure performed before respirators are used:

- Check to ensure that bag containing respirator is intact and that expiration date stamped on bag has not expired.
- Check to make sure respirator is clean.

- Look for breaks or tears in the headband material. Stretch the bands to ensure sufficient elasticity.
- Ensure that all headbands, fasteners, and adjusters are in place and not bent.
- Check the facepiece for dirt, cracks, tears, or holes. Ensure that the rubber is flexible, not stiff.
- Check the shape of the facepiece for possible distortion that may occur if the respirator is not properly stored.
- Check the exhalation valve located near the chin between the cartridge holders by:
 - Unsnapping the cover,
 - Lifting the flexible rubber valve and the valve seat to check for cracks, tears, dirt, and distortion, and,
 - After replacing the cover, ensuring that it spins freely.
- Check both inhalation valves located under the respirator cartridges for the same items listed above.
- Check the cartridge holders to ensure that they are clean, necessary gaskets are in place, threads are not worn, and there are no cracks or other visible signs of damage and ensure that they are the correct type of cartridge required for the job.
- Check cartridges (especially the threaded portions) for dents or other damage.

6.2 Level D Personal Protective Equipment

Personnel working inside the task site and wearing Level D PPE shall wear, as appropriate:

- Safety glasses (see Section 16 of EG&G Idaho Safety Manual)
- Safety shoes as described in Supplement 16.4 of the EG&G Idaho Safety Manual

- Hard hat (see Section 16 of the EG&G Idaho Safety Manual)
- Hearing protection as required in the EG&G Idaho Company Procedures Manual, Number 11.7.

6.3 Level C Personal Protective Equipment

Personnel working inside the task site and wearing Level C PPE shall wear, as appropriate:

- Full-face or half-face air-purifying respirator (with appropriate filters and eye protection) as required by INEL Health Physics and the IH.

NOTE: The use of half-face respirators is not permitted in a radiological environment without authorization of the program/facility manager in consultation with a radiological engineer per EG&G Idaho Company Procedures Manual, Number 11.1.

- Disposable chemical-resistant coveralls
- Anti-c clothing as recommended by RE if radiological hazards exist (see Section 6.6 below)
- Safety shoes as described in Supplement 16.4 of the EG&G Idaho Safety Manual
- Chemically resistant shoe covers
- Hard hat (see Section 16 of the EG&G Idaho Safety Manual)
- Inner chemically resistant gloves
- Outer chemically resistant gloves
- Hearing protection as required in the EG&G Idaho Company Procedures Manual, Number 11.7
- Eye protection as required by SE (see Section 16 of the EG&G Idaho Safety Manual)
- Emergency egress respirator.

6.4 Level B Personal Protective Equipment

Level B is the same as Level C except the respiratory protection is upgraded to air supplied hood or SCBA. Personnel working inside the task site with designated Level B PPEs shall wear, as appropriate:

- Air supplied hood or SCBA
- Emergency egress respirator
- Disposable chemically resistant coveralls
- Anti-c clothing as recommended by the RE if radiological hazards exist (see Section 6.6 below)
- Safety shoes as described in Supplement 16.4 of the EG&G Idaho Safety Manual
- Chemically resistant shoe covers
- Hard hat (see Section 16 of the EG&G Idaho Safety Manual)
- Inner chemically resistant gloves
- Outer chemically resistant gloves
- Hearing protection as required in the EG&G Idaho Company Procedures Manual, Number 11.7.

6.5 Level A Personal Protective Equipment

In rare circumstances, it may be necessary for operating personnel to wear Level A PPE. Level A has the same maximum respiratory protection as Level B; however, the highest available skin and eye protection are required for Level A. All personnel required to wear Level A PPE should include, as appropriate:

- SCBA
- Escape SCBA
- Fully encapsulating, chemically resistant suit
- Additional anti-c clothing as recommended by the RE if radiological hazards exist (see Section 6.6 below)

- Safety shoes as described by Supplement 16.4 of the EG&G Idaho Safety Manual
- Chemically resistant shoe covers (if applicable)
- Hard hat (if applicable)
- Inner chemically resistant gloves
- Hearing protection as required in the EG&G Idaho Company Procedures Manual, Number 11.7.

6.6 Personnel Protection in Radioactively Contaminated Areas

Anti-c clothing shall be worn in contamination control zones. Personal clothing other than underwear and shoes shall not be worn in Zones II and III. Health Physics personnel (HPT and RE) shall define the anti-c requirements for working in areas on the basis of contamination levels determined by surveys and the guidelines below. For entry into Zones II and III, all openings between the coveralls and shoe covers, gloves, and hood shall be taped. Anti-c clothing shall be donned only at or near the contamination control point of the area to be entered. Guidelines for personnel protection in radioactively contaminated areas are contained in the EG&G Idaho Radiological Controls Manual, Chapter 4, Section 3.5.1. The minimum anti-c personal protection for each contamination zone is presented below.

6.6.1 Zone I - Low Level Contamination

The minimum requirements for Zone I anti-c personal protection include:

- One pair of cloth anti-c coveralls (or disposable)
Note: This requirement may be deleted by the HPT for walk-through entries or health physics surveys.
- One pair of shoe covers
- One pair of latex gloves.

6.6.2 Zone II - Moderate Level Contamination

The minimum requirements for Zone II anti-c personal protection include:

- One pair yellow cloth anti-c coveralls (or disposable)
- One yellow cloth hood (or disposable)
- Three pairs of shoe covers (two pairs must be vinyl)
- One pair latex gloves.

6.6.3 Zone III - High Level Contamination

The minimum requirements for Zone III anti-c personal protection include:

- One pair yellow cloth anti-c coveralls and hood
- One pair disposable anti-c coveralls (or plastic anti-c suit) with disposable hood
- Three pairs of shoe covers (two pairs must be vinyl)
- Two pairs of latex gloves
- Respiratory protection commensurate with contamination levels.

7. SAFE WORK PRACTICES

An SWP or SSWP may be required for a task as described in Section 2.4 of the EG&G Idaho Safety Manual. That section along with Supplement 2.2 describe the types of work that require an SWP or SSWP.

Several factors may affect the safe working environment in the field (e.g., inclement weather, confined work space, extended working schedules, work in heavy PPE, temperature, and work done under artificial illumination). These factors can compromise the work performance of task operations personnel. The FTL is responsible for communicating with task operations personnel to ensure safe and efficient work conditions.

7.1 Working in Confined Spaces

If work is to be performed in a confined space, the FTL will ensure the area is safe for entry, work, and egress in accordance with EG&G Idaho Company Procedures Manual, Number 11.3. If appropriate, specific task site instructions for working in confined spaces shall be presented in the task specific addendum. Task operations personnel shall not enter the confined space until safety personnel and the FTL can ensure it to be safe and the SWP is approved.

7.2 Extended Working Schedules

If work schedules must be extended, Section 20 in the EG&G Idaho Safety Manual offers the guidelines and managerial approval needed for personnel working more than a 48-hour week. The FTL is responsible for the safety of task operations personnel; however, when work weeks are in excess of 48 hours, the FTL must realize that physiological and psychological stresses reduce the safety and efficiency of the field operations. Ultimate responsibility for safety of operations belongs to the FTL.

7.3 Working in Heavy PPE

Work performed in heavy PPE creates additional stresses which severely limit the ability of operations personnel to work long shifts. The FTL should be aware of such limitations and adjust schedules accordingly. The IH and HPT will advise the FTL on this issue.

7.4 Working with Artificial Illumination

If hot and/or windy conditions exist during the regular work shift, schedules may be changed to perform operations at night. Artificial illumination, although a necessity, can create an environment of reduced visibility for the workers. Task operations personnel must be alert and cautious as they maneuver around work areas.

7.5 Buddy System

The buddy system is an effective way to ensure each worker is monitored as to his mental and physical well being during the course of a work day. By using the buddy system, task operations personnel can reduce the chance of being ill or injured and not be noticed. This is particularly crucial for workers in the exclusion zone (Section 8.1 of this H&S Plan). The FTL will pair workers to regularly check on one another during the day's activities. Each member of the pair will observe the other for alertness, motor functions, and coherence.

7.6 Handling Drums and Containers

Drums and containers handled during the task shall be addressed in the task specific addendum. Each drum or container shall meet the appropriate DOT, OSHA, and/or EPA regulations for the wastes they contain. The addendum shall address inspection, labeling, handling operations, waste characterization, spill containment, and transportation. EG&G Idaho Company

Procedures Manual, Numbers 8.1, 8.2, and 8.3 address many of the above items. In addition, if the work plan associated with the task addresses the handling and disposing of waste, the work plan shall be referenced in the addendum.

7.7 ALARA Goals

The as low as reasonable achievable (ALARA) policy objective is to reduce personnel and environmental radiation exposures and doses to the lowest levels in keeping with good operating practices. The ALARA program establishes annual radiation dosage goals and management commitments to assist in meeting these goals.

Personnel working at the task site must strive to keep his or her radiation exposure ALARA through the following practices:

- Adhere to all written radiological requirements and verbal guidance
- Be aware of personal radiation exposure history
- Work within ALARA guidelines and make suggestions as needed
- Minimize the production of all radiological waste
- Minimize personal radiation exposure by these basic protection techniques:
 - Time - exposure is minimized as time is minimized
 - Distance - maintain a maximum distance from radiation source
 - Shielding - use any solid material (e.g., lead, steel, concrete) as a shield (Exposure amounts will vary depending on thickness and type of material.)
 - Limits - radiation exposure limits are contained in the EG&G Idaho Radiological Controls Manual, Chapter 2, Section 3.2
- Adhere to general safe work practices discussed in Section 7.9 of this plan.

7.8 Radioactive Spill Control

Contamination in uncontrolled areas is designated as a "spill"; if a spill is noticed, task operations personnel shall initiate the SWIMS approach:

- Stop the spill
- Warn area personnel and notify Health Physics
- Isolate the area
- Minimize exposure to the spill
- Secure any ventilation paths and Health Physics surveys the extent of the spill.

Radioactive spill response is discussed in greater detail in the EG&G Idaho Radiological Controls Manual, Chapter 4, Section 3.8.2.

7.9 General Safe Work Practices

The following are general safe work practices to be followed on each task (if work practices vary from those described below, the FTL must record changes in the task specific addendum):

- Contact lenses shall not be worn in company designated eye-hazard areas unless they are essential to correct a vision defect not correctable by prescription safety glasses. Additional restrictions apply as per the EG&G Idaho Safety Manual, Section 16, paragraph 3.7.
- Eating, drinking, chewing gum or tobacco, smoking, and any other practice that increases the probability of hand-to-mouth transfer and ingestion of material are prohibited within the work/radiation zones. Approved eating areas shall be established or are designated at each Area facility.

- Do not perform work where contaminated substances may be present with an open wound. If a wound is received, report to the HPT and/or IH for further direction.
- Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, etc. Avoid kneeling, leaning, or sitting on equipment or the ground.
- Task operations personnel should watch for dangerous situations (the presence of strong, irritating, and/or nauseating odors, high airborne concentrations of dust, breached drums, etc.). Personnel should report all potentially dangerous situations to the FTL.
- Prevent releases of oil or hazardous materials used in task operations to the extent possible. If spillage occurs, contain it; report it to the facility representative, where applicable; and immediately clean it up in accordance with the Emergency Preparedness Procedures for the Area. Guidelines in Appendix III of the EG&G Idaho Company Procedures Manual, Number 11.6 for spill cleanup may be useful.
- Prevent splashing of contaminated materials during decontamination.
- Keep all potential ignition sources at least 50 ft from an explosive or flammable environment and use non-sparking, explosion-proof equipment.
- Task operations personnel will familiarize themselves with the physical characteristics of the task site including but not limited to:
 - Wind direction
 - Accessibility to fellow workers, equipment, and vehicles

- Communications at and near the task site
 - Exclusion zones (areas of known or suspected contamination)
 - Site access (both Area and Task)
 - Nearest water sources
 - Warning devices
 - Nearest emergency assistance.
-
- At all times, a worker in the exclusion zone shall be in line-of-sight contact with his partner.
 - Observe your coworker. Look for signs of exhaustion, heat or cold stress, or exposure to harmful vapors. Ask regularly if he/she is okay. Talk to your partner.
 - All wastes generated during the task site investigation shall be managed in accordance with the EG&G Idaho Safety Manual, Section 15.
 - Adhere to strict personal hygiene practices such as washing face, neck, and hands before eating, drinking, smoking, or using the restroom. Keep hands away from mouth and eyes when working in an exclusion zone or after handling samples or sample containers. A complete shower may be required at the end of a work shift (IH or HPT discretion).
 - Proceed directly to a survey station upon leaving a radiological contamination zone. Care should be taken not to touch the face, mouth, and eyes before a survey has been performed.

8. WORK/RADIATION ZONES, SITE ENTRY, AND SECURITY

Based on the expected levels of contamination and work activity anticipated by each task, several work/radiation zones may be established for the task site. If it is determined that specific zones must be established for a particular task, then entry shall be controlled. Unnecessary personnel shall be excluded. Visitors must (a) notify the FTL in advance of the visit, (b) obtain the required training as specified in Section 3 of this H&S Plan, and (c) have business at the task site to obtain access.

Figure 8-1 provides an example of an approved work site and its established work zones as recommended by NIOSH, 10/85. If work zones are deemed necessary by the FTL upon the advice of the HPT, SE, and/or IH, each project's established work zones should be documented in the task specific addendum. Several work zones required for Levels A, B, C, and D work activities are:

- Exclusion zone
- Contamination area
- Contamination reduction corridor
- Contamination reduction zone
- Support area.

Radiological control zones will be established or incorporated into the work zones as required by the RE. Task site areas with radiological contamination in excess of the limits established in Chapter 4 of the EG&G Idaho Radiological Controls Manual shall be posted or labeled as specified in that chapter of the manual.

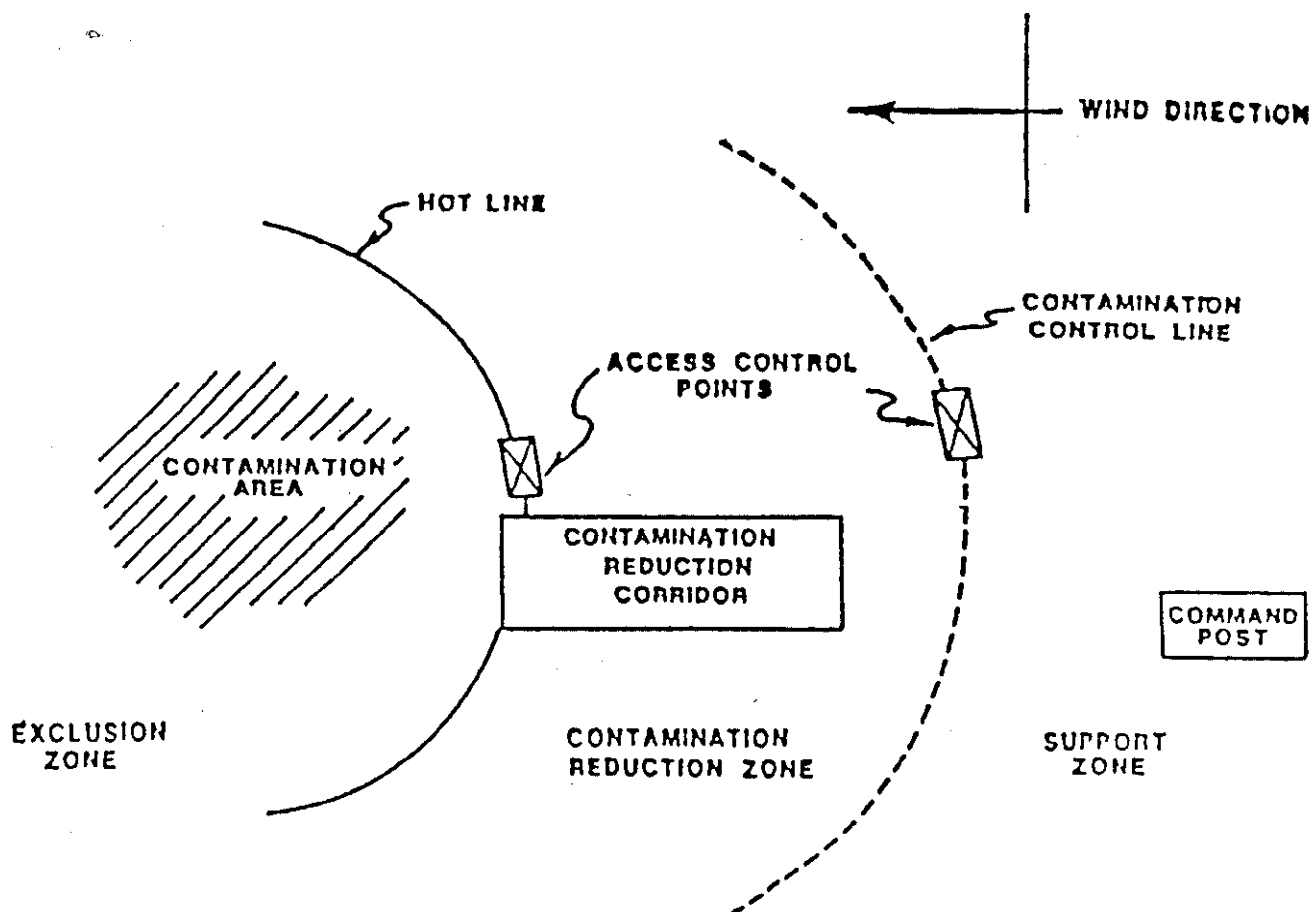


Figure 8-1. Diagram of typical hazardous material task site as recommended by NIOSH, 10/85.

8.1 Work Zones

8.1.1 Exclusion Zone

The exclusion zone includes the immediate work area around the contamination area. The minimum number of personnel required to safely perform the required operations will be allowed into the exclusion zone. The cordon around the exclusion zone is called the "Hot Line."

8.1.2 Contamination Area

The contamination area is the immediate area inside the exclusion zone where investigation activities are taking place. In this area, operations personnel may be subject to the hazards listed in Section 5 of this H&S Plan.

8.1.3 Contamination Reduction Corridor

The contamination reduction corridor is a transition area between the exclusion zone and the support zone. This area will serve as a decontamination area for equipment and a PPE removal area for task operations personnel. In addition, this area may contain emergency response equipment, equipment resupply, and a worker temporary rest area. Due to potential contamination, sample packaging and preparation equipment should not be stored here, but rather, in a contamination free area.

8.1.4 Contamination Reduction Zone

The contamination reduction zone is an area that surrounds the exclusion zone and contamination reduction corridor. This area may consist of several work stations (i.e., sampling, handling, and record keeping) as well as staging areas for equipment. The cordon around the contamination reduction zone is called the "contamination control line."

8.1.5 Support Area

The support area is the area outside the contamination reduction zone. It may contain the equipment trailer, command post, vehicle parking, equipment staging, or any support activity related to the task at hand. All personnel not trained in hazardous material work and visitors are restricted to this area.

8.2 Radiological Control Zones

External radiation control areas and radioactive contamination zones are identified and posted as radiological hazards through the use of barriers and postings. Barriers are used to help confine radiological hazards to a specific area. Yellow and magenta ribbons, ropes, tags, and signs are used to keep unauthorized personnel out of the area. External radiation control areas and radioactive contamination zones shall be posted in accordance with the EG&G Idaho Company Procedures Manual, Number 10.10 and the EG&G Radiological Controls Manual, Chapters 2 and 4. Task specific radiation control areas and contamination zones shall be determined by the RE and HPT and documented in the addendum.

8.2.1 External Radiation Exposure Control

External exposure control is accomplished by identifying areas containing sources of radiation and controlling personnel access into these areas. Section 2 of the EG&G Idaho Radiological Controls Manual discusses external radiation exposure control requirements. These areas shall be posted in accordance with the provisions stated above.

External exposure control is achieved through the following:

- a. Controlled Area - Any area where radioactive materials or elevated radiation fields may be present shall be clearly and conspicuously posted as a controlled area.
- b. Radiation Area - Any area within a controlled area where an individual can receive a dose equivalent greater than 5 mrem but less than 100 mrem in 1 hr at 30 cm from the radiation source.
- c. High Radiation Area - Any area within a controlled area where an individual can receive a dose equivalent of 100 mrem or greater but less than 5 rem in 1 hr at 30 cm from the radiation source.
- d. Very High Radiation Area - Any area within a controlled area where an individual can receive a dose of 5 rem or greater in 1 hr at 30 cm from the radiation source. Access to these areas shall be maintained, locked, or physically guarded.

8.2.2 Radioactive Contamination Control

Radioactive contamination controls limit the amount of radioactive surface contamination which individuals are exposed to minimize possible inhalation, ingestion, or absorption of radioactive material; to minimize the potential for release of radioactivity to the environment; and to prevent external contamination of personnel. Contamination limits are set primarily to define "detectability" or the lower limit of detection under ideal conditions. The fundamental philosophy is that no "detectable" contamination will be released to uncontrolled areas. The limits are not based on hazards to personnel but to maintain a high degree of control, restricting radioactive contaminants by engineered barriers. Chapter 4 of the EG&G Idaho Radiological Controls Manual discusses radioactive contamination control in more detail.

Contamination is classified as Zone I, II, or III based on contamination levels as follows:

- Zone I Limits of Contamination
 - 200 to 5000 dpm/100 cm² beta-gamma
 - 20 to 50 dpm/100 cm² alpha
- Zone II Limits of Contamination
 - >5000 to 20,000 dpm/100 cm² beta-gamma
 - >50 to 250 dpm/100 cm² alpha
- Zone III Limits of Contamination
 - >20,000 dpm/100 cm² beta-gamma
 - >250 dpm/100 cm² alpha.

9. ENVIRONMENTAL AND PERSONNEL MONITORING

Employee exposure to contaminants and physical hazards will be monitored during all task site activities using an appropriate combination of techniques. The FTL in conjunction with the appropriate personnel (e.g., IH, HSO, RE, SE, and HPT) for each task shall list any monitoring equipment requirements for specific potential hazards in the task specific addendum. An example of items that may be monitored is:

1. Organic vapor using an organic vapor monitor
2. Combustible gas using a combustible gas indicator
3. Heat or cold stress using field measurements and observations and, if necessary, body temperature measurements
4. Radiation and contamination surveys using radiological monitoring equipment
5. Personal exposure to organic vapors, particulate contamination (heavy metals) using personal monitoring pumps and appropriate filter collection media (active sampling)
6. Personal exposure to radiation using thermoluminescent dosimeters (TLDs) and direct reading dosimeters (DRDs)
7. Mercury vapors using a mercury vapor detector
8. Noise levels using a sound level meter and/or noise dosimeter
9. Loose radiological contamination using smears or large area wipes. |

9.1 Chemical Exposure Monitoring

Selective monitoring of high-risk task operations personnel at the chest or face level for organic vapors may be recommended by the IH. The monitoring devices used, frequency of monitoring, designated high-risk jobs to be monitored, and action levels for hazardous contaminants shall be discussed in the task specific addendum.

Equipment for monitoring organic vapors at the task site shall be identified by the IH. The equipment, monitoring schedule, and calibration methods shall be discussed in the task specific addendum. The monitoring activities shall be initially based on the job hazard analysis results.

9.2 Combustible Gas Monitoring

If deemed necessary by the SE, the task site will be monitored for combustible gases at time intervals recommended by the SE. Elevated readings from the organic vapor detector might indicate the presence of combustible gases. The SE and IH will advise the FTL on circumstances when work at the task site will be suspended and the course of corrective action, and ensure the task site is safe before work continues. Action levels for combustible gases shall be documented in the task specific addendum.

9.3 Radiological Monitoring

The RE and HPT will be responsible for radiological monitoring in accordance with the EG&G Idaho Radiological Controls Manual, Chapters 2 and 4; and Section 10 of the EG&G Idaho Company Procedures Manual.

9.3.1 External Radiation Exposure Control

Personnel exposures are monitored by TLDs and DRDs. Personnel are responsible for properly wearing the specified dosimetry while in

radiologically controlled areas. If the TLD (or other dosimetry) is lost, task operations personnel shall immediately notify the FTL and HPT. TLDs are supplied and processed by the Operational Dosimetry Unit.

Radiation surveys shall be performed by the HPT to determine the extent and magnitude of radiation levels and to enable posting of radiation areas. Surveys shall be performed in accordance with the EG&G Idaho Radiological Controls Manual, Chapter 2, Section 3.8.

9.3.2 Radioactive Contamination Control

All surfaces or areas with contamination levels in excess of those levels stated in Section 8.2 of this plan shall be monitored and controlled to prevent the spread of contamination. Contamination surveys shall be performed by the HPT in accordance with the EG&G Idaho Radiological Controls Manual, Chapter 4, Section 3.3.

All personnel shall obtain a whole body survey after exiting a contamination zone; the whole body survey must be done for two to three minutes. The following portable instruments are most commonly used to detect personnel contamination: (a) Ludlum 2a, (b) Eberline RM-14, and (c) Ludlum 177 with pancake probe (frisker), for beta-gamma contamination; and (d) Ludlum Model 61 and (e) Eberline Pac-4s, for alpha contamination. In addition to portable field instruments, the following personnel contamination monitors may be used: (a) large area detectors, (b) portal monitors, (c) personnel contamination monitors, and (d) hand and foot monitors.

9.4 Heat and Cold Stress Control and Monitoring

The FTL will set work/rest schedules as recommended by the IH. Depending upon the ambient weather conditions or work conditions and physical response of task operations personnel, the IH will suggest adjustments of the work/rest cycle to the FTL. The FTL, HSO, and/or IH will ensure that

operations personnel follow established work and break schedules, adequately replace body fluids, and keep body temperatures in a normal range in accordance with the EG&G Idaho Company Procedures Manual, Number 11.10.

Workers will be interviewed by the IH and/or HSO periodically to ensure that the controls are effective and excessive heat exposure is not occurring. Workers will be encouraged to monitor their body signs and take a break if symptoms of heat stress occur.

Task operations personnel shall be aware of the following signs and symptoms of heat stress:

- CONFUSION
- FAINTING
- SLURRED SPEECH
- Clammy skin
- Dizziness
- Fatigue
- Nausea
- Profuse sweating
- Skin color change
- Vision problems.

Task operations personnel who exhibit any of these symptoms will be immediately removed from the task site. An individual who shows any of the symptoms that are capitalized and underlined, or any other evidence of change in level of consciousness, will be transported to an OMP facility for medical evaluation. Mental confusion and decreased level of consciousness must always be considered an emergency requiring medical evaluation and treatment. Transportation to a medical facility or use of an ambulance should be considered normal procedure in this situation. Individuals showing any of the remaining symptoms listed will be provided cool water and allowed to rest. On any occasion when the FTL, worker experiencing the heat stress symptoms, or IH

believes the heat stress is severe or desires medical evaluation, the employee may be brought to an OMP medical facility.

Rest breaks shall include the following preventive measures:

- Drink adequate liquids
- Rest in a cool, shaded area
- Remove protective clothing to allow evaporative cooling
- Do not perform other work during the break.

If personnel are wearing semipermeable or impermeable PPE, the work/rest schedule may be adjusted and monitoring of individual personnel temperatures may be required by the IH. If ambient temperatures are considered excessive by the IH and/or symptoms outlined above exhibited, workers must be monitored for heat stress and recovery. This includes measuring heart rates and temperatures. Temperatures can be obtained using disposable thermometers. The HSO will ensure that sufficient liquids (electrolyte replacement fluids such as Gatorade) are provided and that they are consumed only in the designated and approved eating/drinking area.

Adequate protective clothing as required by IH should be worn to protect against the cold. Extra care must be exercised while working in this environment. Workers should observe each others facial extremities (ears and nose) for signs of frostbite (whitening of the skin surface). Decreased mental coherence and body movements are signs of hypothermia. Individuals with suspected hypothermia or other significant cold injury (e.g., frostbite) will be taken to an OMP medical facility.

Finally, the FTL or IH will refer a worker to the OMP for medical evaluation whenever there is doubt concerning the medical ability of an employee to continue in the assigned task.

9.5 Noise-Level Monitoring

If high noise levels are encountered by operations personnel at the task site, worker exposure will be assessed by the IH. A hearing conservation program must be developed by the IH when the sound levels exceed an 8-hour time weighted average of 85 dBA. Noise level monitoring, PPE requirements, and audiometric tests shall be outlined in the hearing conservation program for the task or employee. Requirements shall be imposed by the PM based on the advice of the IH and the requirements stated in the EG&G Company Procedures Manual, Number 11.7 and the EG&G Industrial Hygiene Manual, Section 26.

9.6 Physical Hazard Control and Monitoring

The FTL will have the primary responsibility for ensuring the task site is maintained in a safe condition by requiring maintenance of barriers and signs, correction of unsafe conditions, and cleaning of debris and trash. The appropriate personnel (e.g., IH, SE, and HPT) will inspect and recommend changes in work habits to the FTL.

Individuals working on a task have a specific responsibility to use safe work techniques, report unsafe working conditions, and exercise good personal hygiene and housekeeping habits throughout the course of their job.

9.7 Record Keeping Requirements

ERP is required to maintain the following information in the ARDC program file in accordance with 29 CFR 1910.120:

- Copies of the Management Plan for the Environmental Restoration Program, Task Specific H&S Plan, QPP, QAPjP, and work plan.

In addition, ERP shall track the following information for each ERP hazardous material worker through the Training and Emergency Action Unit of the Waste Management Operations Support Group:

- Proof of training in health and safety hazard recognition, radiation worker training, respirator training, and any other training specific to the employee
- Required training and updates
- Copy of the signed Health and Safety Certification Form.

The IH is required to maintain a logbook of air monitoring data, personal sampling data, times of sampling intervals, calibration of instruments, and identity of personnel wearing the monitoring equipment. Instrumentation detection ranges and uncertainties should also be recorded in the IH logbook. The HPT is required to keep a logbook of all radiological monitoring, daily operational activities, and instrument calibrations. All project records and logbooks, except HPT logbooks, shall be forwarded to ARDC within 30 days after completion of the task.

Doc. No.: EGG-WM-9979
Section No. H&S Plan
Revision No. 3
Date November 1991
Page No. 9-8

10. DECONTAMINATION PROCEDURES

Decontamination procedures for personnel and equipment are necessary to control contamination and to protect operations personnel. Both chemical and radiological decontamination are discussed in this section. However, combined chemical and radiation decontamination procedures are not discussed here and must be developed by the IH and RE if required for a specific task. Decontamination procedures shall be presented in the task specific addendum. These procedures can be amended upon recommendations by the IH, RE and/or HPT. When chemically hazardous material decontamination or radiological decontamination is required, the following procedures are suggested.

10.1 Modified Level A and B Decontamination Procedures

If Level A or B PPE is required, then two decontamination stations will be used at the task site--one at the hotline between the exclusion zone and the contamination reduction corridor and one at the contamination control line, which is the personnel access point to the support zone from the contamination reduction corridor. Decontamination Station A supports personnel and equipment exiting the exclusion zone. Figure 10-1 lists the recommended decontamination procedures. Steps 1 through 8 shall be completed at Station A. Coveralls shall be removed at Station B.

10.2 Modified Level C Decontamination Procedures

Decontamination Station B should be located at the personnel access to the contamination reduction corridor. It is to be used by personnel working in the contamination reduction corridor. Figure 10-2 lists the modified Level C decontamination procedures. If Tyveks are worn (if recommended by the IH), they are decontaminated and removed at Station A.

1. Remove equipment	EXCLUSION ZONE
2. Wash and rinse boot covers and gloves	
3. Remove tape	
4. Remove boot covers, outer gloves, and hood	
5. Disconnect air hose and tape end	
<hr/>	
6. Wash and rinse suit and boots	HOT LINE (STATION A)
7. Remove suit	CONTAMINATION REDUCTION CORRIDOR
8. Wash, rinse, and remove inner gloves	
9. Remove coveralls	
<hr/>	
10. Field wash/shower	CONTAMINATION CONTROL LINE (STATION B)
11. Put on personal clothing	SUPPORT ZONE

Figure 10-1. Recommended modified Level A and B PPE hazardous chemical decontamination steps.

- | | |
|---|---------------|
| 1. Remove equipment | CONTAMINATION |
| 2. Wash and rinse boot covers and gloves (if worn) | REDUCTION |
| 3. Remove tape | CORRIDOR |
| 4. Remove boot covers and outer gloves | |
| 5. Wash, rinse, and remove boots and suit (if worn) | |
| 6. Remove and drop respirator | |
| 7. Wash, rinse, and remove inner gloves | |
| 8. Remove coveralls | |
| <hr/> | |
| 9. Field wash/shower | CONTAMINATION |
| | CONTROL LINE |
| | (STATION B) |
| 10. Put on personal clothing | SUPPORT ZONE |

Figure 10-2. Recommended modified Level C PPE hazardous chemical decontamination steps.

At the end of the work day, a full-body shower may be required by the IH or HPT.

10.3 Radiological Decontamination

Radiological decontamination shall be done under the direct supervision of Health Physics (RE and/or HPT) and in accordance with the EG&G Idaho Company Procedures Manual, Number 10.4. Figures 10-3, 10-4, and 10-5 provide the anti-c removal steps for the three contamination control zone designations. Any personnel and personal property contamination may be removed with tape, vacuuming (vacuum must be equipped with a high efficiency particulate air filter), washing with soap and water, or by mechanical means (grinding, etc.).

10.4 Equipment Decontamination and Disposal of Contaminated Materials

Decontamination procedures for equipment shall be recorded or referenced in the task specific addendum. All waste generated by performing decontamination must be disposed in accordance with Section 15 of the EG&G Safety Manual for hazardous nonradioactive waste and radioactive mixed waste. Radioactive waste shall be handled in accordance with the EG&G Idaho Radiological Controls Manual, Chapter 6. Disposable clothing, tools, buckets, brushes, and other contaminated equipment shall be secured and disposed as stated in the task specific addendum. Unused contaminated equipment that can be used at a later time shall be placed in plastic bags and stored at the task site. Decontamination of monitoring equipment should also be addressed.

Radioactive waste shall be handled in accordance with the EG&G Idaho Radiological Controls Manual, Chapter 6. Decontamination operations for equipment and areas shall be performed in accordance with approved procedures.

Zone I Removal Barrier

1. Remove outer shoe covers
2. Remove gloves
3. Remove coveralls
4. Remove shoe covers (during the process of stepping through barrier)

EGRESS POINT

5. Remove cloth glove liners

Figure 10-3. Anti-c removal steps for radiological control Zone I.

Zone II Removal Steps

1. Remove outer shoe covers
2. Remove latex gloves
3. Remove hood, coveralls, and shoe covers (remove shoe covers during process of stepping through barrier)

EGRESS POINT

4. Remove cloth glove liners

Figure 10-4. Anti-c removal steps for radiological control Zone II.

Zone III Removal Barrier

1. Remove outer shoe covers
2. Remove latex gloves
3. Remove disposable hood, coveralls, and shoe covers (remove shoe covers during process of stepping through barrier)

EGRESS POINT A

4. Pull inner hood back and remove respirator
5. Remove inner latex gloves
6. Remove cloth hood, coveralls, and shoe covers (remove shoe covers during process of stepping through barrier)

EGRESS POINT B

7. Remove cloth glove liners

Figure 10-5. Anti-c removal steps for radiological control Zone III.

10.5 Decontamination During Medical Emergencies

If a person is injured or becomes ill and lifesaving care is required, the situation will be evaluated by the appropriate personnel (e.g., first aid personnel) on a case-by-case basis. Emergency care will be initiated in accordance with the emergency preparedness procedure for the facility at which the task is being performed. Medical care necessary to save life or limb is not delayed for decontamination. In such cases decontamination may be performed at the medical facility. The IH and/or HPT will accompany the employee to the medical facility and relay information requested by medical personnel.

11. EMERGENCY PROCEDURES, EQUIPMENT, AND INFORMATION

Work at hazardous waste sites makes emergencies a continuous possibility, no matter how infrequently emergencies may occur. Emergencies happen quickly, unexpectedly, and require immediate response. The reporting requirements of Section 3 of the EG&G Idaho Safety Manual shall be followed by personnel at the task site. Locations and telephone numbers of emergency personnel and facilities will be posted at places specified in the task specific addendum. The appropriate emergency facilities will be notified by telephone at the beginning of the task to inform personnel at the facilities that work has begun at the task site. The following sections describe the procedures used during emergency situations; equipment that will be available for emergency situations; and agencies, facilities, and personnel who must be notified in case of emergency.

11.1 Emergency Procedures

The following procedures will be used if an emergency arises:

- FTL will be notified of accidents or conditions that have the potential for adversely affecting or threatening personnel safety, property, or environment. The FTL is responsible for ensuring that the EG&G Idaho Safety Manual and the emergency action procedure for the facility are followed in the event of an accident or unusual condition.
- All safety related occurrences will be recorded in a field logbook and reported as indicated in Section 3 of the EG&G Idaho Safety Manual.

11.1.1 Personnel Occupational Injury or Illness in the Exclusion Zone

In the event of an occupational injury or illness in the exclusion zone, an assessment of the situation shall be made by the FTL using the advice of appropriate personnel (e.g., IH, SE, personnel trained in first aid). If the situation is deemed reportable as described in Section 3 of the EG&G Idaho Safety Manual, the FTL is responsible for initiating reporting procedures. In addition, task personnel shall act in accordance with the emergency preparedness procedures for the facility at which the task is being performed. In the event that the task site is shut down due to an injury, task operations personnel shall not reenter the exclusion zone until the cause of the injury or illness is identified and corrective action implemented. Decontamination shall be performed in accordance with the above mentioned emergency procedures and with recommendations made by the IH, HPT, and/or first aid personnel.

11.1.2 Personnel Occupational Injury or Illness in the Support Zone

If an occupational injury or illness occurs in the support zone, the same procedures as described in Section 11.1.1 shall be followed. If the FTL determines the cause of the occupational injury or illness and the absence of the injured or ill party does not affect the performance of other personnel, task operations will continue.

11.1.3 Transportation and Followup of Injury

An injured worker transported to a medical facility will be accompanied by at least one worker (preferably the IH and/or HPT) to inform medical personnel of the level of decontamination performed before leaving the task site and provide specific details about the illness or injury.

11.1.4 Fire/Explosion

Before initiating task activities, brush and grass will be cleared from the task site to eliminate the risk of fire. The EG&G Idaho Safety Manual, Section 11 and any applicable facility emergency preparedness procedures shall be reviewed.

In the event of a fire or explosion, all personnel not essential to controlling the situation will be evacuated from the task site, and fire and/or explosive experts will be notified. In addition, Section 11 of the EG&G Idaho Safety Manual and applicable emergency action procedures for the facility at which the task is being performed shall be followed.

11.1.5 Personal Protective Equipment Failure

If any task site worker experiences a failure or alteration of PPE, that person and his workmate shall immediately leave the exclusion zone. The HPT and IH will assess the situation and determine if exposure to hazardous substance or radiological uptake has occurred. Reentry will not be permitted until the equipment has been repaired or replaced.

11.1.6 Other Equipment Failure or Hazardous Material Spill

If task site equipment fails to operate properly, the FTL will be notified and will determine the effect of the failure on continuing operations. If the failure affects the safety of personnel or prevents completion of the tasks described in the SAP or other work plan, operations personnel shall leave the task site until the situation is evaluated and appropriate actions are taken.

If hazardous or potentially hazardous material is spilled, refer to the emergency preparedness procedure for the Area in which the task is being performed and report the spill to Area personnel as directed. Spillage of

petroleum products, decontamination solutions, calibration material, equipment fuels, and other liquids containing hazardous materials must be assessed.

11.1.7 Hand Signals

Hand signals shall be used if an emergency situation arises and communication becomes impossible or unsafe. The following hand signals will be used in an emergency:

- Hand gripping throat - signals that the person is out of air or cannot breathe
- Grip partner's wrist or both hands around waist - means leave area immediately
- Hands on top of head - signals that assistance is needed
- Thumbs up - okay, I am all right, I understand
- Thumbs down - no, I am not all right, I do not understand.

11.1.8 Emergency Escape

In cases of life-threatening emergencies such as fire or explosion, personnel should leave the vicinity using the shortest possible route without regard for decontamination at that time and move upwind of the affected area. When the situation has stabilized, personnel will take necessary steps to decontaminate themselves, equipment, and other affected areas.

11.1.9 Task Operations Shutdown

Task operations may be suspended for several reasons as indicated below. However, the reasons for operations shutdown are directly related to the

degree of hazard each task possesses. Specific reasons for suspending task operations should be listed in the task specific addendum. Examples include excessive vapor/gas concentrations, radiological hazards, uncovering waste, inclement weather, etc.

- If a combustible gas indication >10% of the lower explosive limit (LEL) occurs indicating a buildup of explosive vapors, work shall stop. Evaluation of the situation will be made and a course of action determined by the FTL in conjunction with the IH and/or SE.
- When significant radiological hazards are identified by an HPT at the sampling site.
- When unexpected hazardous material is uncovered or found in soil samples, even when the appearance of such material may not be associated with a rise in detected contamination levels.
- In addition, drilling, sampling, instrumentation, and other weather sensitive activities will stop during consistent high winds (i.e., >25 mph), electrical storms, or other inclement weather that may affect the work.

11.1.10 Task Site Reentry

In all situations, when a task site emergency results in evacuation of the task site, personnel shall not reenter until authorized to do so by the FTL. The FTL will ensure that:

1. The hazards have been reassessed by the HSO, IH, SE, and/or the RE.
2. The conditions resulting in the emergency have been corrected.

3. The task specific H&S Plan, SAP, Operational Safety Requirements/Safety Assessments, Standard Operating Procedures (SOPs), DOPs, and the Facility Emergency Action Plan have been reviewed as appropriate.
4. Site personnel have been briefed on any changes in the ERP task specific H&S Plan.

Reentry into an evacuated zone to monitor or collect air samples requires the more restrictive of Level C PPE or the level used by those individuals who evacuated the task site. The IH may upgrade to Level B or A if deemed necessary.

11.2 Warning Devices

Warning lights and/or audible alarms shall be installed in areas where needed to warn personnel against remaining in or entering a hazardous area. An explanatory sign or tag shall be posted immediately adjacent to a warning device to describe the hazardous condition and indicate the action to be taken. Table 12.1 in Section 12 or the EG&G Idaho Safety Manual lists various audible warning devices, their meanings, and the required personnel action. Specific warning devices for the task shall be listed in the task specific addendum. Warning devices for radiological hazards (e.g., remote air monitors) shall also be listed.

11.3 Emergency Equipment

The following emergency equipment shall be available at the task site during field operations as appropriate. (A complete emergency equipment list shall be provided in the task specific addendum.)

Fire Extinguishers: Because of the potential threat of fire at hazardous waste sites, at least one 20-lb (minimum) ABC fire extinguisher will be

readily available and at hand throughout the task activities. Additional fire extinguishers may be necessary. This should be indicated in the task specific addendum.

SCBA: Two SCBAs will be available for emergencies such as reentering a contaminated zone to retrieve injured personnel.

First Aid Kits: An industrial first aid kit with sufficient supplies for five people shall be kept in the support zone. The OMP will advise on the selection of first aid supplies to be included at each task site. The HSO will be responsible for maintaining the proper level of first aid supplies in the task site first aid kit.

Eye Wash: Portable eyewash fountains with sufficient potable water for flushing will be readily available for the duration of the task. The location of the eyewash will be determined by the IH.

Communications: Emergency telephone numbers shall be included in the task specific addendum and posted for all operations personnel. Emergency communication shall be discussed in the safety training prior to initiation of site investigation activities. A two-way radio or telephone with capability to contact emergency personnel shall be located on each task site.

Personal Hygiene: A sufficient supply of clean water, hand soap, and towels will be provided at the task site.

Radiological Contamination Spill Kit: Depending on the location of the task and recommendation from RE, a spill kit shall be prepared in advance and located in appropriate work areas. These kits shall contain, at a minimum, the following radiological control equipment:

- Plastic Bags

- Absorbent materials (e.g., paper or rags)
- Latex gloves and glove liners
- Plastic shoe covers and/or rubber overshoes
- Smear paper and holders
- Pencils, grease pencils, and paper
- Radiological tags and signs and radiation rope or ribbon
- Yellow plastic sheeting and duct tape.

12. BIBLIOGRAPHY

American Conference of Governmental Industrial Hygienists, Threshold Limit Values and Biological Exposure Indices for 1989-1990, Second Printing.

EG&G Idaho, EG&G Idaho Company Procedures Manual.

EG&G Idaho, EG&G Emergency Action Manual.

EG&G Idaho, Industrial Hygiene Manual.

EG&G Idaho, Radiological Controls Manual.

EG&G Idaho, Safety Manual.

EG&G Idaho Environmental Restoration Program, Health and Safety Plan for Operations Performed for the Buried Waste Program, Environmental Restoration Program, EGG-WM-8504, May 1989.

EG&G Idaho Environmental Restoration Program, Management Plan for the EG&G Environmental Restoration Program, EGG-WM-8676.

EG&G Idaho Environmental Restoration Program, Program Directives.

National Archives and Records Administration, Code of Federal Regulations, 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response."

National Archives and Records Administration, Code of Federal Regulations, 29 CFR 1926, Subpart P, "Excavations."

NIOSH/OSHA/USCG/EPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985.

Hazardous Material References:

Buried Sludge Waste Characterization, TLC-29-88, T. L. Clements, Jr. ltr to C. J. Bonzon, May 2, 1988.

Engineering Design File BWP-ISV-004, Detailed Estimate of Radioactive Contents for Pit 9, E. C. Garcia and J. L. Knight.

Estimate of Rocky Flats Plant Organic Wastes Shipped to the RWMC, D. E. Kudera, July 24, 1987.

Radioactive Waste Management Information System content code material listing, 1954 to 1970.

Doc. No.: EGG-WM-9979
Section No. H&S Plan
Revision No. 3
Date November 1991
Page No. 12-2

Doc. No.: EGG-WM-9979
Section No. H&S Plan
Revision No. 0
Date April 1992
Page No. A-1

ADDENDUM

HEALTH AND SAFETY PLAN FOR THE TEST AREA NORTH GROUNDWATER REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Doc. No.: EGG-WM-9979
Section No. H&S Plan
Revision No. 0
Date April 1992
Page No. A-2

CONTENTS

A.1	Introduction	5
A.1.1	Scope of Work	5
A.1.2	Background	8
A.2	Responsibilities	10
A.3	Personnel Training	13
A.4	Medical Surveillance Program	13
A.5	Hazard Evaluation	13
A.5.1	Potential Onsite Hazards	13
A.5.2	Hazards Analysis	17
A.6	Levels of Protection and Personal Protective Equipment	20
A.6.1	Personal Protection Used on Previous Site Visits.	20
A.6.2	Personal Protective Equipment	20
A.6.3	Action Levels Regarding Limitations in Tasks Assigned, PPE Requirements, and Withdrawal from Site	24
A.7	Safe Work Practices	25
A.7.1	Variations to Safe Work Practices Listed in Section 7 of the Main Body of the HSP	25
A.7.2	Additional Safe Work Practices for the Task Site	25
A.8	Work/Radiation Zones, Site Entry, and Security	26
A.8.1	Perimeter Establishment	26
A.8.2	Description of Work/Radiation Zones Including Site Entry and Security	26
A.9	Environmental and Personnel Monitoring	29
A.9.1	Operations and Monitoring Equipment Checklist	29
A.9.2	Medical Surveillance Procedures	30
A.9.3	Personnel Monitoring	30
A.9.4	Operating Procedures and Methods for Surveillance	31
A.10	Decontamination Procedures	31
A.10.1	Personnel Decontamination Procedures	31
A.10.2	Decontamination of Sampling and Monitoring Equipment	31
A.10.3	Decontamination Modification (e.g., personnel, surfaces, materials, instruments, equipment)	32
A.10.4	Disposal Procedures	32

A.11	Emergency Procedures, Equipment, and Information	33
A.11.1	Emergency Reference List	33
A.11.2	Emergency Routes	33
A.11.3	Emergency Procedures	34
A.11.4	Emergency Equipment	39
A.12	Additional Information	40
A.13	Health and Safety Certification Form	41

FIGURES

A-1.	Map of TAN well sites	9
A-2.	Field organization chart	12
A-3.	Generic site map for activities on highly contaminated wells . . .	27
A-4.	Generic site map for activities on wells with low levels of contamination	28
A-5.	Emergency route to the medical facility	35
A-6.	Emergency route from wells to the TSF area	36
A-7.	Emergency route to the Central Facilities Area	37

TABLES

A-1.	Site investigation team	11
A-2.	Training required for task site personnel	14
A-3.	Known onsite contaminants and their concentrations in the TAN area groundwater	15
A-4.	Known onsite contaminants and their concentrations at the TSF-05 injection well site	16
A-5.	Values using a photoionization detector	24
A-6.	Operations and monitoring equipment checklist	30
A-7.	Emergency reference list	33
A-8.	Responsibilities of task site personnel	38
A-9.	Emergency equipment	39
A-10.	First aid supplies	40

ADDENDUM

HEALTH AND SAFETY PLAN FOR THE TEST AREA NORTH GROUNDWATER REMEDIAL INVESTIGATION/FEASIBILITY STUDY

A.1 INTRODUCTION

Task: TAN Groundwater RI/FS Project No. EGG-WM-9979

DOE Operations Office: DOE-ID

Project Manager: G. J. Stormberg Phone No.: 6-1241

Other Contact: J. R. Zimmerle Phone No.: 5-5892

Date Plan Requested: 09/04/91

Purpose of Task: The objective of this task is to adequately characterize the Test Area North (TAN) Groundwater under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.

Proposed Dates of Work: October 1, 1991 - September 29, 1994

A.1.1 Scope of Work

The scope of this project is to characterize the groundwater underneath the TAN facility at the Idaho National Engineering Laboratory (INEL). The project will support the remedial investigation/feasibility study (RI/FS) of the groundwater at TAN, as required by the Federal Facility Agreement/Consent Order (FFA/CO). Primary activities will include drilling wells for collecting groundwater samples, and completing the wells for use as monitoring wells to determine the extent and magnitude of the groundwater contamination at TAN. A brief description of the tasks can be found below.

- Task 1: Drilling into the regional aquifer. This task will involve drilling up to ten new aquifer monitoring wells to approximately 500 ft as specified in the Work Plan, and conversion of five existing wells near the Water Reactor Research Test Facility (WRRTF) into monitoring wells. Wells will be intermittently cored, tested, and sampled to define the vertical extent of groundwater contamination. Core samples will be taken for physical and geochemical characterization of the subsurface. Wells will be located in the vicinity of TAN. Drill cuttings will be surveyed with field instruments [see the Field Sampling Plan (FSP)]. If no activity is detected, the cuttings will be disposed of near the TAN disposal pond. Cuttings with measurable levels of activity will be sampled, boxed, and sent to the Radioactive Waste Management Complex. Well development water will be treated at the TAN Portable Water Treatment Unit and discharged to the TAN disposal pond.
- Task 2: Sampling wells with low levels of contamination. This task will involve sampling new and existing wells to help characterize the groundwater below TAN as specified in the FSP. Groundwater from a network of approximately 37 monitoring wells will be sampled. Analyses may include volatile organics, contract laboratory program (CLP) metals, inorganics, and radionuclides. Well purge water will be treated at the TAN Portable Water Treatment Unit and discharged to the TAN disposal pond.
- Task 3: Sampling wells with higher levels of contamination. This task will involve sampling existing and new wells that have or may have contaminant levels that exceed regulatory standards. These wells would include the Technical Support Facility (TSF)-05 injection well, the USGS-24 well, TAN Disposal 2, and possibly the two new wells being installed in between the injection well and USGS-24. Analyses may include volatile organics, CLP metals, inorganics, and radionuclides. Well purge water will be treated at the TAN Portable Water Treatment Unit and discharged to the TAN disposal pond.

- Task 4: Well logging. This task will involved geophysical logging and inspection of the new wells using television cameras and other methods as specified in the FSP. Equipment inserted into the well will be decontaminated as specified in Section A.10.2.
- Task 5: Monthly water level measurements. This task will involve taking measurements of the water levels at all wells in the vicinity of TAN as specified in the FSP. Measurements will be taken with an electronic sensor or a steel tape.
- Task 6: Well tests to determine hydraulic conductivity and sustained well contamination levels. Up to twenty wells in the vicinity of the injection well may be tested either by pumping water at rates up to 50 gallons per minute for 20 minutes to 2 hours or by using pneumatic techniques. The results from these tests will be used to calculate the hydraulic conductivities or sustained contamination levels of the wells. All of the new wells will be tested at multiple depths as specified in the FSP. The other wells will be tested as built. Test water (if generated) will be contained and treated at the TAN Portable Water Treatment Unit.
- Task 7: Hose/pipe removal from the injection well. When sludge removal work on the injection well ended in 1990, 300 ft of hose and pipe were left in the well. This hose and pipe is connected to a jetting device that was used to loosen the sludge. Before additional work can be done on the well, the hose, the pipe, and the jetting device will be removed. This task will include in-place deconning of the hose/pipe; removing the hose/pipe with a crane; boxing the radioactively contaminated hose, pipe, and jetting device; and activities associated with containing and sampling any water or sludge still in the hose/pipe. Technical details on removing the hose/pipe are contained in an Environmental Restoration Department approved operating procedure for WAG 1, "Air Injection Pump, Hose, and Pipe Removal from the FFA/CO TSF-05 Injection Well Located at

Test Area North," February 1992. All work will be done inside a ventilated enclosure (1,000 cubic feet per minute) that will be built around the well.

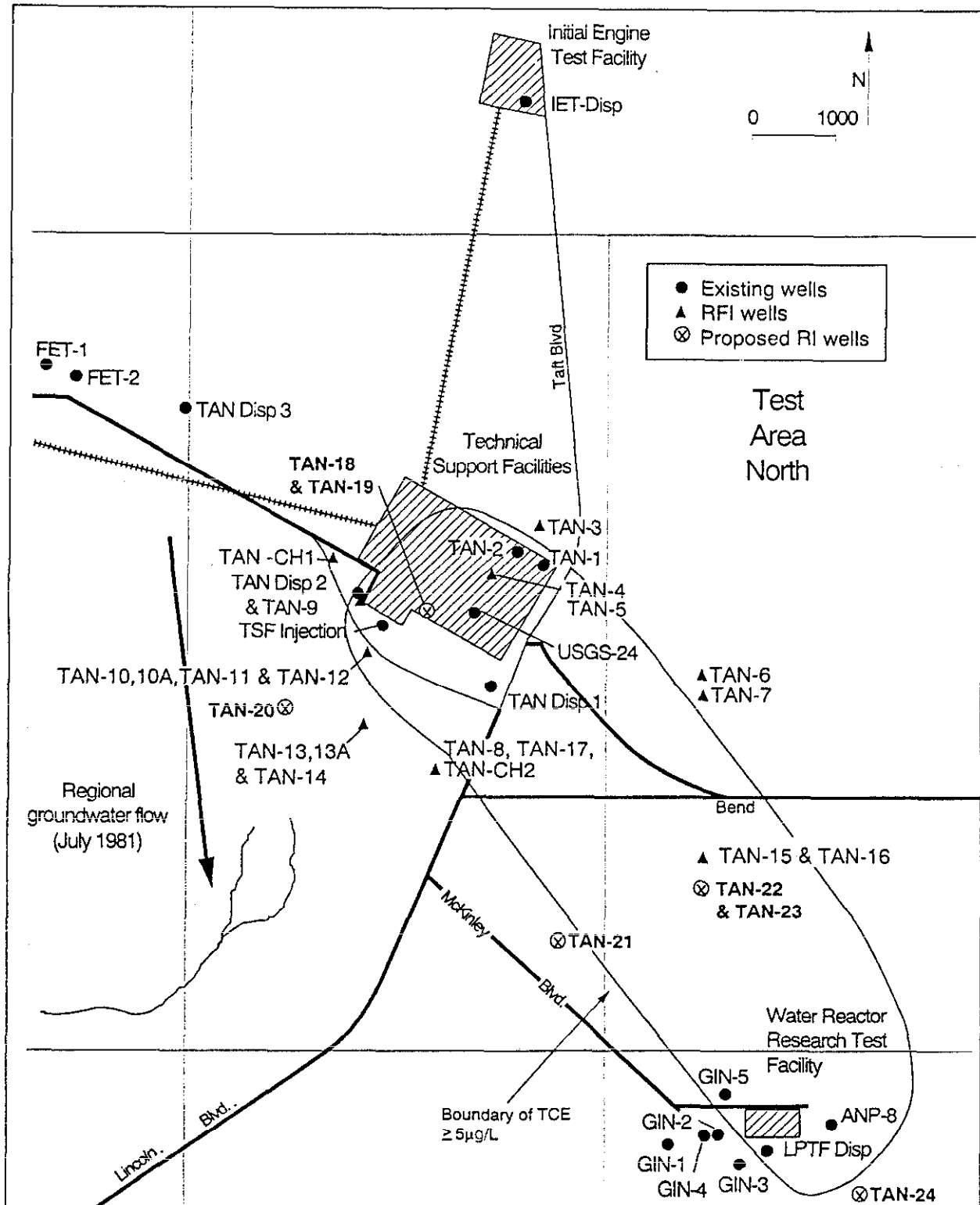
All contained water will be sampled and treated at the TAN Portable Water Treatment Unit. Sludge will be drummed and stored for disposal at the INEL designated mixed waste disposal facility.

A.1.2 Background

A.1.2.1 Task Site Description. The project area is located at TAN-TSF and the immediate vicinity. See Figure A-1 for additional information.

A.1.2.2 Waste Description (type and location). Waste encountered during this project will be primarily in the form of contaminated groundwater generated during drilling and well development activities. It is possible that contaminated drill cuttings will also be produced during drilling, and that small amounts of mixed waste sludge will result from sampling of the injection well and from removal of the hose/pipe from the injection well.

Primary contaminants expected to be encountered include radionuclides (Co-60, Cs-137, Sr-90, and H-3), metals (lead and mercury), and chlorinated hydrocarbons [trichloroethylene (TCE) and perchloroethylene (PCE or tetrachloroethylene)]. These contaminants have been consistently found during previous sampling activities at several wells in the area. These primary contaminants have been found in concentrations ranging from below to slightly above the regulatory limit in most of the existing wells. The only exception is the TSF-05 injection well where contaminant concentrations in the groundwater are well above the regulatory limits. Trace concentrations of other contaminants have also been found in TAN wells. The complete list is given in Tables A-3 and A-4 (see pages A-15 and A-16, respectively).



Z91 0087

Figure A-1. Map of TAN well sites.

A.1.2.3 Unusual Features (e.g., containers, buildings, dikes, power lines, terrain). Unusual features are not present for this project. All planned work will be away from buildings, power lines, and dikes. Terrain in the area is mainly level.

A.1.2.4 Status of Task Site (active, inactive, unknown). The TAN facilities are still active, but normal facility activities will not be impacted by the planned RI/FS tasks. Most of the existing and planned wells are outside of facility fences. RI/FS activities inside facility fences will use exclusion zones to protect TAN and RI/FS workers.

A.1.2.5 History (worker or nonworker injury, complaints from public, previous agency action). This investigation is in support of the CERCLA RI/FS as a result of a confirmed release of contaminants to the aquifer. Additional information can be found in the RI/FS FSP.

A.1.2.6 Previous Onsite Monitoring; Previous Sampling Data. Previous groundwater-sampling data can be found in the TAN RFI Work Plan, EGG-ER-8084, and in the appendices of the RI/FS Work Plan. Previous industrial hygiene measurements using field instruments have found no detectable levels of organics in worker breathing zones during previous work on existing wells. The only radioactively contaminated well, based on past surveys, is the TSF-05 injection well.

A.2 RESPONSIBILITIES

Table A-1 shows the proposed site investigation team (see Figure A-2). It is the responsibility of the Health and Safety Officer, the Job Site Supervisor, and the Field Team Leader (FTL) to ensure that all requirements stated in the base Health and Safety Plan (HSP) and this addendum are complied with and that the effectiveness of this HSP is evaluated. This project will comply with all applicable Occupational Safety and Health Administration (OSHA) regulations, American National Standards Institute standards, and the American Conference of Governmental Industrial Hygienists threshold limit

Table A-1. Site investigation team

<u>Personnel</u>	<u>Discipline/Tasks Assigned</u>
G. J. Stormberg	Project Manager
J. F. Kaminsky	Principal Investigator/Field Team Leader Job Site Supervisor
To be determined (TBD) ^a	Industrial Hygienist
TBD ^a	Health Physicist
J. R. Lord	Technician
R. A. Danielsen	Technician
On-site IH	Health Safety Officer
TBD ^a	Geologist/Job Site Supervisor
A. H. Wylie	Hydrogeologist/Job Site Supervisor
TBD ^a	Well Drilling Contractor

a. Well drilling subcontractors and personnel from EG&G Industrial Hygienist and Health Physicist offices will be used as available. Names of specific personnel will be entered into the field logbooks and safe work permit at the start of each task.

values for exposures to chemical and physical agents as declared in Department of Energy (DOE) 5480.10, "Contractor Industrial Hygiene Program," DOE/ID 5483.1A, "Occupational Safety and Health Standards," and DOE/ID 5480.4, "Environmental Protection, Safety, and Health Protection Standards (*Industrial Hygiene Manual*, Section 3).

FIELD ORGANIZATIONAL CHART

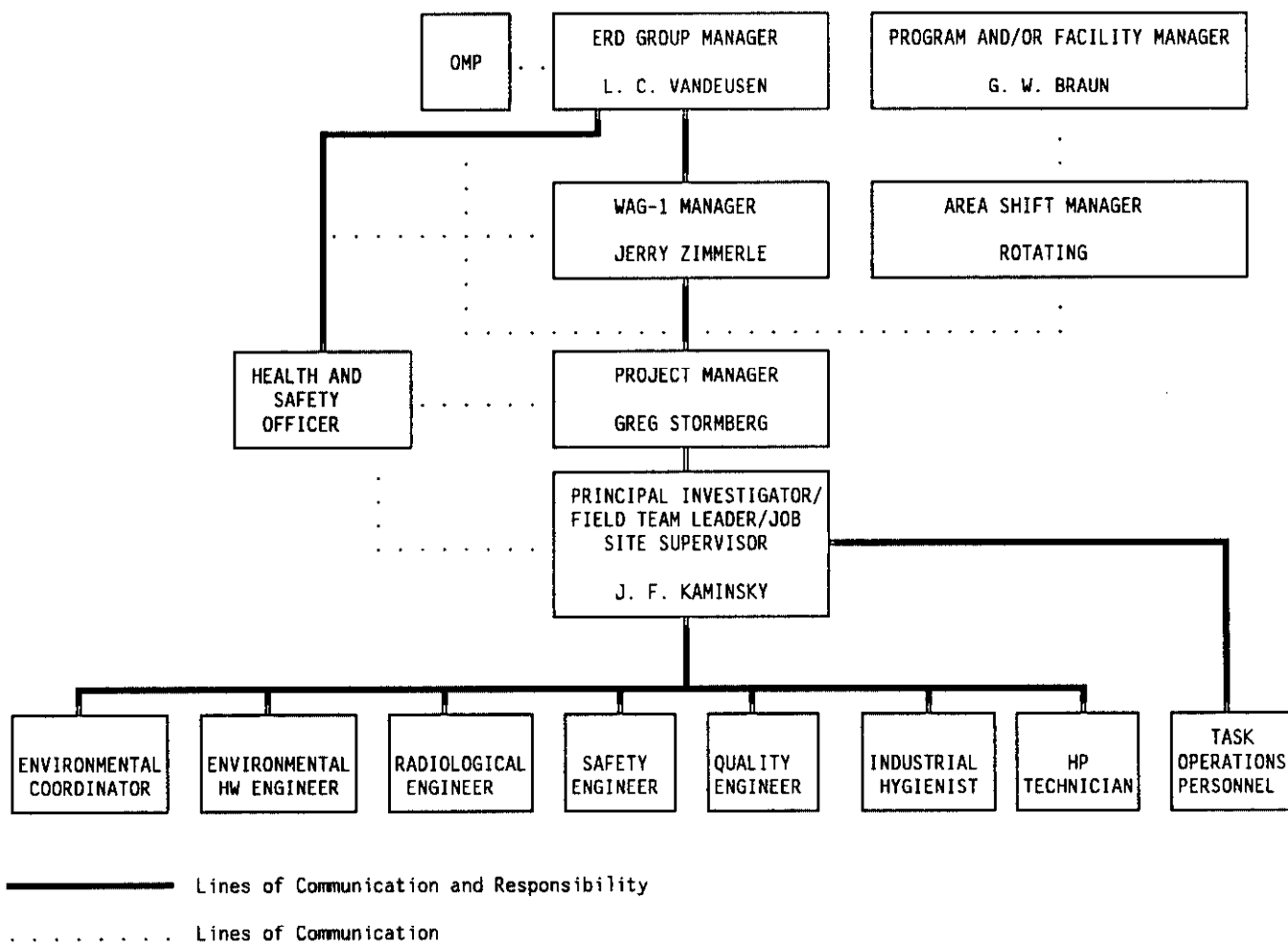


Figure A-2. Field organization chart.

A.3 PERSONNEL TRAINING

The following is an outline of site orientation tasks based on the outline presented in Section 3 of this Health and Safety Plan.

All field personnel will be trained per 29 CFR 1910.120 and the *EG&G Idaho Safety Manual*, Section 8, "Safety Certifications, Training, and Meetings." Additional required training may include, but is not limited to, respirator fit test qualification and radiation worker.

In addition to the training mentioned above, at least one worker with Medic First (CPR and first aid) training shall be present at the task site when task site personnel are present. The Principal Investigator and the Field Team Leader/Job Site Supervisor shall have hazardous waste worker supervisor training. Table A-2 shows the training required for task site personnel.

The Principal Investigator or the Field Team Leader/Job Site Supervisor will ensure that all task site personnel understand site-specific hazards through daily briefings. The Principal Investigator will also ensure that task site personnel are trained about any unique hazards or procedures and this HSP.

A.4 MEDICAL SURVEILLANCE PROGRAM

The requirements for medical surveillance are adequately discussed in Section 4 of the main body of this HSP and in Section A.9.2.

A.5 HAZARD EVALUATION

A.5.1 Potential Onsite Hazards

Based on available information, potential onsite hazards include those listed in Tables A-3 and A-4.

Table A-2. Training required for task site personnel

<u>Training^a</u>	<u>Operations Personnel</u> <u>Required</u>	<u>Task/Project Manager</u> <u>Required</u>	<u>Industrial Hygienist</u> <u>Required</u>	<u>Health Physicist</u> <u>Required</u>	<u>Principal Investigator</u>	<u>Field Team Leader/ Job Site Supervisor</u> <u>Required</u>
Task site orientation	X	X	X	X	X	X
Decontamination ^b	X	X				X
Hazard communication ^b	X	X	X	X	X	X
Signs, tags, warning devices ^b	X	X	X	X	X	X
Hazardous waste operator	X	X	X	X	X	X
Hazardous waste supervisor		X			X	X
Hearing conservation	X	X	X	X		X
Radiation worker qualification	X	X	X	X	X	X
Medic 1st		X	X			X
Respirator fit test qualification	X	X	X	X		X

a. Training should be current through original or refresher certification and requalification. The field team leader will verify current training prior to the start of each task.

b. May be part of Task site orientation.

Table A-3. Known onsite contaminants and their concentrations in the TAN area groundwater^a

Substance	CAS No.	Environmental Concentration (w/units)	In Sample (soil, water air, waste)	Toxicity		Symptoms	Carcinogenicity	Waste Characteristics
				TLV (ppm)	Route of Exposure			
Trichloro-ethylene	79-01-6	1-1300 ug/L	water	25	Inhalation/skin	see note	--	--
Tetrachloro-ethylene	127-18-4	2-71 ug/L	water	0.4 ^b	Inhalation/skin	see note	NIOSH CA	--
1,2-dichloro-ethylene	540-59-0	2-85 ug/L	water	200	Inhalation/skin	see note	--	--
1,1,1-tri-chloroethane	71-55-6	2-12 ug/L	water	350	Inhalation/skin	see note	--	--
Acetone	67-64-1	1-72 ug/L	water	250	Inhalation/skin	skin and eye irritant	--	--
Methanol	67-56-1	100%	decontam- ination	200	Inhalation/skin	skin and eye irritant	--	--
Strontium	--	0.7-470 picocuries/L	water	--	--	--	--	Radioactive
Tritium	--	90-9,800 picocuries/L	water	--	--	--	--	Radioactive

a. Low-levels (<10 ppb) of mercury, methyl ethyl ketone, 1,2-dichloroethane, carbon tetrachloride, 1,1-dichloroethylene, 1,1-dichloroethane, toluene, and chloroform were also detected in some water samples from the groundwater monitoring wells. Lead at up to 515 $\mu\text{g/l}$ has also been found in a few wells. These contaminants are not expected to become airborne in significant levels due to the low water concentration levels. As a precaution, provisions have been made for onsite monitoring for organics and mercury by the onsite IH. Data were obtained from 1989 and 1990 sampling of area wells (see Appendices C and D of the RI/FS Work Plan).

b. Keep as close to zero as possible

Note: Irritation of eyes or mucous membranes, dizziness, nausea, lack of coordination, elevated feelings.

Table A-4. Known onsite contaminants and their concentrations at the TSF-05 injection well site^{a,b}

Substance	CAS Number	Environmental Concentration (w/units)	In Sample (soil, water, air, waste)	Toxicity				Waste Characteristics
				Exposure Limit (ppm)	Route of Exposure	Symptoms	Carcinogenicity	
Methylene chloride	75-09-2	290 ppm	In sludge	50	Inhalation/skin/eyes	See note	Suspected human carcinogen	--
1,2-dichloroethene	540-59-0	410 ppm	In sludge	200	Inhalation/skin	See note	--	--
Trichloroethylene	79-01-6	30,000 ppm 35 ppm	In sludge In water	50	Inhalation/eye irritant/skin/ingestion	See note	NIOSH carcinogen	--
Tetrachloroethylene	127-18-4	2,800 ppm	In sludge	0.4 ^b	Inhalation/skin	See note	NIOSH CA	--
2-butanone (MEK)	79-93-3	1,800 ppm	In sludge	200	Inhalation/ingestion/skin/eyes	See note	Not applicable	--
Methanol	67-56-1	100%	decontamination	200	Inhalation/skin	Skin and eye irritation	--	--
Co-60	--	812 picocuries/gm	In sludge	--	--	--	--	Radioactive
Cs-137	--	2540 picocuries/gm	In sludge	--	--	--	--	Radioactive
Eu-154	--	6.62 picocuries/gm	In sludge	--	--	--	--	Radioactive
Am-241	--	23.6 picocuries/gm	In sludge	--	--	--	--	Radioactive
Tritium	--	1,000 picocuries/ml	In sludge	--	--	--	--	Radioactive
Plutonium-239	--	12.2 picocuries/gm	In sludge	--	--	--	--	Radioactive

a. Low levels of chloroform, 1,1-dichloroethene, and 1,1,1-trichloroethane were also detected in the sludge. Data were obtained from samples taken from injection well sludge and from water decanted from the sludge (see Appendix B of the RI/FS Work Plan).

b. Keep levels as close to zero as possible.

Note: Irritation of eyes or mucus membrane, dizziness, nausea, lack of coordination, elevated feelings.

A.5.2 Hazards Analysis

All substances listed in Tables A-3 and A-4 have the hazard potentials listed below.

A.5.2.1 Chemical Agents. Hazards during well drilling, testing, and sample retrieval consist of the potential inhalation of dusts and organic vapors from volatile organics (such as TCE and PCE) and metals (such as lead), and possible skin contact with various contaminants. Dusts from these operations are expected to be non-hazardous and are not expected to exceed regulated levels based on previous well drilling activities.

A.5.2.2 Fire and Explosion Hazards. There is a possibility for a buildup of combustible gases during well drilling. The onsite industrial hygienist will monitor the atmosphere near the well using a combustible gas indicator. The industrial hygienist will stop operations if combustible gases exceed 10% of the lower explosive limit. Since these operations will be outdoors, natural ventilation will be used to reduce the potential hazard.

A.5.2.3 Oxygen Deficiency/Confined Space. Based on available information, oxygen deficiency and work in a confined space environment are not anticipated in this project.

A.5.2.4 Radiological Hazards. Based on previous well drilling and testing, sampling, and logging activities at TAN, there are no radiation hazards with any of the existing groundwater wells. The only exception is the injection well that contains sludge and water with radioactive contamination. The primary radionuclides in the sludge are Cesium-137 and Cobalt-60 with trace amounts of Americium-241, Strontium-90, Tritium, Europium-154, and Plutonium-239 (see Table A-4 for concentrations).

The water contamination includes Cesium-137, Cobalt-60, Strontium-90, and Tritium. The concentrations of these contaminants are all <2,000 picocuries/L (except for tritium at 10,000 picocuries/L). RI/FS activities will be surveyed, and if radiation levels exceed 100 cpm or if any detectable alpha is

found, operations will stop until the Site Health Physicist (HP) can evaluate the situation and recommend appropriate personal protective equipment.

Any of the planned wells that are within 1/4 mi of the injection well may have the same level of contamination as the injection well. Therefore, the same levels of personnel protection for the injection well will be used at these wells until the onsite Industrial Hygienist and the HP determine that lower levels are acceptable (see Section A.6). Dusts from these planned well drilling activities (Task 1) are not expected to exceed background radiation levels. Water from the planned well drilling may be contaminated with low levels of radionuclides, primarily Cesium-137, Cobalt-60, Strontium-90, and Tritium.

The pipe in the injection well may present a special radiological hazard. Loose contamination on the pipe from rust or any remaining sludge could come free once the pipe is brought to the surface. Pipe removal will be done within an enclosure to prevent loose contamination from being released to the environment.

A.5.2.5 Biological Hazards. Based on available information, biological hazards have not been a problem in the past.

A.5.2.6 Industrial Safety Hazards. Industrial hazards associated with drilling and heavy equipment are anticipated. Safety measures in accordance with Section 5.6 of the main body of this HSP will be taken.

A.5.2.7 Electrical Hazards. Based on available information, the only electrical hazard anticipated is associated with the use of portable generators to power field equipment. Ground-fault interrupter circuits will be used on all outdoor connections. Care will be taken to keep the generator and associated equipment out of and away from any water (if present at the work site). As a precaution, drilling masts will be located at a minimum of 20 ft from all overhead electrical lines, and drilling should not be done any closer than 5 ft from buried electrical utilities.

A.5.2.8 Heat/Cold Stress. During extreme weather conditions, proper exposure monitoring, clothing, fluid intake, and/or work/rest regiments will be implemented by the onsite IH or the Field Team Leader per the *Industrial Hygiene Manual*, Section 20. Some of the tasks in this project will probably be completed when there is a potential for heat stress resulting from the ambient air temperature. The FTL will monitor the temperature and adjust work/rest cycles according to the response of sampling personnel. Any team member who exhibits heat stress symptoms such as dizziness, profuse sweating, skin color change, vision problems, or confusion will be removed immediately from the work area and allowed to rest. If symptoms persist or if the FTL deems necessary, the team member will be taken to the nearest medical facility. The work schedule can be altered to take advantage of cooler ambient temperatures that occur in the late night or early morning periods of the day.

Exposure to low temperatures may also be a factor if work is done in the evening hours, if winds are high, if unpredictable weather moves in, and in the winter months (e.g., at 50°F, with a 25 mph wind, the equivalent chill temperature is 32°F). *EG&G Idaho Company Procedures Manual*, Number 11.10, discusses the hazards of cold stress. The FTL and the onsite IH will monitor workers for symptoms of cold stress such as whitening of the skin, especially at the extremities (nose, ears, fingers, etc.).

A.5.2.9 Noise Hazards. High noise levels will be encountered during drilling operations. Safety measures in accordance with Section 5.10 of the main body of the HSP will be taken.

A.5.2.10 Other Hazards. Based on available information, other hazards include snakes, ticks, and spiders near the wells. Steam will be used to decontaminate drilling equipment and the pipe in the injection well. Standard industrial procedures will be used to protect workers (exclusion zones) and to contain contaminated condensates. Steam condensate from the pipe removal task will be allowed to drain back into the well.

A.6 LEVELS OF PROTECTION AND PERSONAL PROTECTIVE EQUIPMENT

A.6.1 Personal Protection Used on Previous Site Visits.

Level D personal protective equipment (PPE) was worn during field activities at TAN similar to the proposed activities at existing wells. Previous drilling and sampling occurred in both FY-89 and FY-90, and included wells TAN-3, TAN-4, TAN-5, TAN 6, TAN-7, TAN-8, TAN-9, TAN-10, TAN-11, TAN-12, TAN-13, TAN-14, TAN-15, and TAN-16. Level C PPE was not required in either FY-89 or FY-90 based on field measurements by the onsite IH and HP, and available lab data.

Level C PPE was used during remediation activities at the TAN TSF-05 injection well.

A.6.2 Personal Protective Equipment

Tasks 1, 2, 4, and 5: The following shows the level of protection required for well drilling farther than 1/4 mi from the injection well (areas of lower contamination), well sampling with no or low levels of contamination, well logging, and monthly water level measurements. Well drilling within 1/4 mi of the injection well be handled with a higher level of PPE (see below).

A_____ B_____ C_____ D_ X _____

Sampling personnel must wear the following Level D PPE unless the project HP or IH instructs otherwise:

- Safety glasses or goggles
- Latex gloves (optional inner cloth gloves)
- Steel-toed, leather boots or shoes
- Suitable work clothing (coveralls or Tyvek if recommended)
- Thermo-luminescent detectors (TLD) badges.

Tasks 3, 6, and 7: The following shows the level of protection required for sampling activities at the TSF-05 injection well and other highly contaminated wells, well testing at all wells within 1/4 mi of the injection well, and hose/pipe removal from the injection well. Well drilling within 1/4 mi of the injection well will require this level of PPE. Well testing PPE can be downgraded based on the recommendations of the onsite IH and HP.

A_____ B_____ C X D_____

Sampling personnel must wear the following Level C PPE unless the project HP or IH instructs otherwise:

- Full mask and air purifying respirator, which are approved by the National Institute of Occupational Safety and Health (NIOSH)
- Safety glasses or goggles
- Latex gloves (optional inner cloth gloves)
- Safety boots or shoes with plastic booties and shoe covers
- Hooded, chemical-resistant clothing/Tyveks or Saranex
- Coveralls
- Thermo-luminescent detectors (TLD) badges
- Air sampling or lapel monitors if required by onsite IH
- Zone 1 or Zone 2 anti-C clothing combined with chemical-resistant clothing if required by the onsite HP and IH as described in Section 6.6 of the main body of this HSP.

A.6.2.1 Respiratory and Dermal Requirements - PPE. Personnel must wear Level D or C PPE as described in Section A.6.2. Any upgrades or downgrades of PPE for work activities will be based on measurements taken by the onsite HP and IH.

A.6.2.2 Selection Criteria. PPE selection is based on recommendations contained in the Occupational Safety and Health Guidance Manual for Hazardous

Waste Site Activities (NIOSH, 1985). PPE selection will be based primarily on hazard assessment data and work task requirements. Level C protection should be selected when the type of hazardous airborne substance is known, the concentration is measured, criteria for using air-purifying respirators are met, and skin and eye exposure are unlikely. Monitoring of the air must be performed to comply with OSHA regulations and to ensure respirator effectiveness. Level C PPE requirements are given in Section A.6.2.

Level D protection is primarily a work uniform. It should not be worn in the support zone when respiratory or skin hazards exist. Level D PPE requirements are given in Section A.6.2.

Based on INEL history, on types and quantities of known contaminants, and on the low probability of encountering significant unknown contaminants at most of the TAN groundwater monitoring wells, the recommended level of PPE at wells farther than 1/4 mi from the injection well is Level D. Using the data given in the appendices of the Work Plan, the maximum quantity of organics at these wells does not exceed 200 $\mu\text{g/l}$. Similarly, the maximum radionuclide concentrations are below 1,000 picocuries/L with most of the wells having no detectable radionuclide levels. Therefore, Level D PPE is justified for these wells with low levels of contamination.

Based on INEL history for the TSF-05 injection well and wells within 1/4 mi of the injection well, and on types and quantities of known contaminants, the recommended level of PPE at these sites is Level C. Again, using the data given in the Work Plan and based on water decanted from the sludge, the maximum organic concentration in any water removed from the injection well will be 30,000 $\mu\text{g/l}$ or 30 ppm. Radionuclide concentrations will be less than 10,000 picocuries/L. In addition, there will be small particles of hazardous and radioactive sludge in the water during most of these RI/FS activities. Therefore, Level C PPE is the prudent choice.

Task personnel may be subjected to larger volumes of concentrated sludge only during hose and pipe removal from the injection well. Based on sludge

data given in Section 2 and the PPE level selected for the initial well remediation, Level C respiratory protection is still acceptable for this task. The exclusion zone around the injection well will be established as a Zone 1 for the pipe removal task. The onsite HP can upgrade the protection level to a Zone 2 if required by onsite measurements. Zone 1 and Zone 2 PPE and action levels are given in Sections 6.6 and 8.2.2, respectively, of the main body of this HSP.

A.6.2.3 Modification for Personal Protection Requirements. If photoionization readings exceeding the levels listed in Section A.6.3 are encountered, work will stop, and detector (Draeger) tubes for TCE and other potential contaminants will be used to verify the presence or absence of those contaminants. The IH may recommend altered work practices or PPE based on that information.

Similarly, the onsite HP will check radiation levels using the field instruments listed in Section A.9.1. If readings exceed those listed in Section A.6.3, work will stop, and the HP may recommend altered work practices or PPE.

Samples collected during drilling as well as the open bore holes and the immediate work zone will be monitored using instruments such as photoionization detectors and radiation survey meters in order to verify adequacy of personal protective equipment. Action limits requiring PPE upgrade are given for sustained organic vapor readings in the parts per million (ppm) range as listed in Section A.6.3. Sustained measurements near or exceeding the levels listed in Section A.6.3 will require continued monitoring with both the HNu and combustible gas detector. If elevated levels do not dissipate, work will be stopped until the Industrial Hygienist, the task area Health and Safety Officer, and the Field Team Leader decide on a course of action that will allow safe operations.

In addition, all samples collected will be checked by an HP. Samples that exceed the levels listed in Section A.6.3 will be double bagged and handled as radioactively contaminated samples.

Periodic sampling for organic and mercury vapors using sampling methods approved by NIOSH will be conducted in order to verify direct instrument readings and to provide more accurate personnel exposure data. In addition, lapel air samplers that indicate the presence of organic and mercury vapor will be used in the work zone breathing space. Lapel samplers will be worn to establish a baseline. If initial analytical results are negative, lapel samplers will be worn periodically as established by the IH.

A.6.2.4 Levels of Protection. Engineering controls such as exclusion zone design and drill rig positioning will be used whenever feasible to minimize use of personal protective equipment. At the initial entry, each work location may be monitored for hazardous contaminants using appropriate instruments such as an HNu photoionization detector, a combustible gas indicator, and radiation survey meters as described in Section A.6.2.3.

A.6.3 Action Levels Regarding Limitations in Tasks Assigned, PPE Requirements, and Withdrawal from Site

For all tasks, if HNu readings exceed 5 ppm sustained for 5 minutes or 50 ppm for 2 minutes in the worker's breathing zone, all work in the exclusion area will be stopped, and the situation will be assessed by the IH, the HP, and the FTL. The values shown below in Table A-5 are for sustained measurements using an 11.7 ev photoionization detector as outlined in selection criteria.

Table A-5. Values using a photoionization detector

<u>Reading of</u>	<u>Requires</u>
0-5 ppm	Level D PPE
5-10 ppm	Level C PPE
10-500 ppm	Level B PPE
500 ppm +	Level A PPE

If field radiation instruments exceed 100 cpm or detect any alpha, all work in the exclusion area will be stopped, and the situation will be assessed by the IH, the HP, and the FTL.

If the combustible gas indicator exceeds 10% of the lower explosive limit, the onsite IH will stop operations until the level drops.

If any worker faints, becomes dizzy or sick, or generally incoherent, all work in the exclusion zone will be stopped. All workers will leave the exclusion zone, and the situation will be assessed by the IH, the HP, and the FTL.

A.7 SAFE WORK PRACTICES

A.7.1 Variations to Safe Work Practices Listed in Section 7 of the Main Body of the HSP

The safe work practices listed in Section 7 of the main body of the HSP are excellent general practices. These safe work practices will be adhered to for all tasks.

A.7.2 Additional Safe Work Practices for the Task Site

A safe work permit will be obtained for all tasks. All tools and equipment will be surveyed by an HP for release prior to removal from the site. Drums and containers will be handled in accordance with company procedures. Drums containing mixed waste solids or any waste liquid will be handled with extra care to avoid a release to the environment. Special precautions will also be taken around all drill rigs. The FTL will remind operating personnel about the extra hazards associated with rapidly spinning equipment.

A.8 WORK/RADIATION ZONES, SITE ENTRY, AND SECURITY

A.8.1 Perimeter Establishment

Site secured: _____ Containment zones mapped: _____
Perimeter identified: X Containment zones identified: _____

The exclusion zone where operations will be conducted will be identified by safety rope or tape as needed during all tasks. Requirements for exclusion zones for groundwater sampling activities will be based on the maps shown in Figures A-3 and A-4, and on FTL, IH, and HP recommendations.

Figure A-3 is a generic site map for highly contaminated well activities such as well drilling (Task 1), well sampling (Task 3), well testing (Task 6), and hose/pipe removal (Task 7). Figure A-4 is a generic site map for wells with low or no contamination or activities for which no significant personnel exposure is expected. These tasks include some well drilling (Task 1), well sampling (Task 2), well logging (Task 4), monthly water level measurements (Task 5), and some well testing (Task 6).

A.8.2 Description of Work/Radiation Zones Including Site Entry and Security

Chapter 8 of this HSP will be followed. EG&G Idaho personnel will use site control zones (based on Figures A-3 and A-4) as established by the IH and the HP when doing all tasks.

Contamination control zones for laboratory processing of samples will be established by the HP based on field measurement of samples.

The only existing contamination control zone that will be encountered during these tasks will be at the injection well. The interior of the well casing is contaminated.

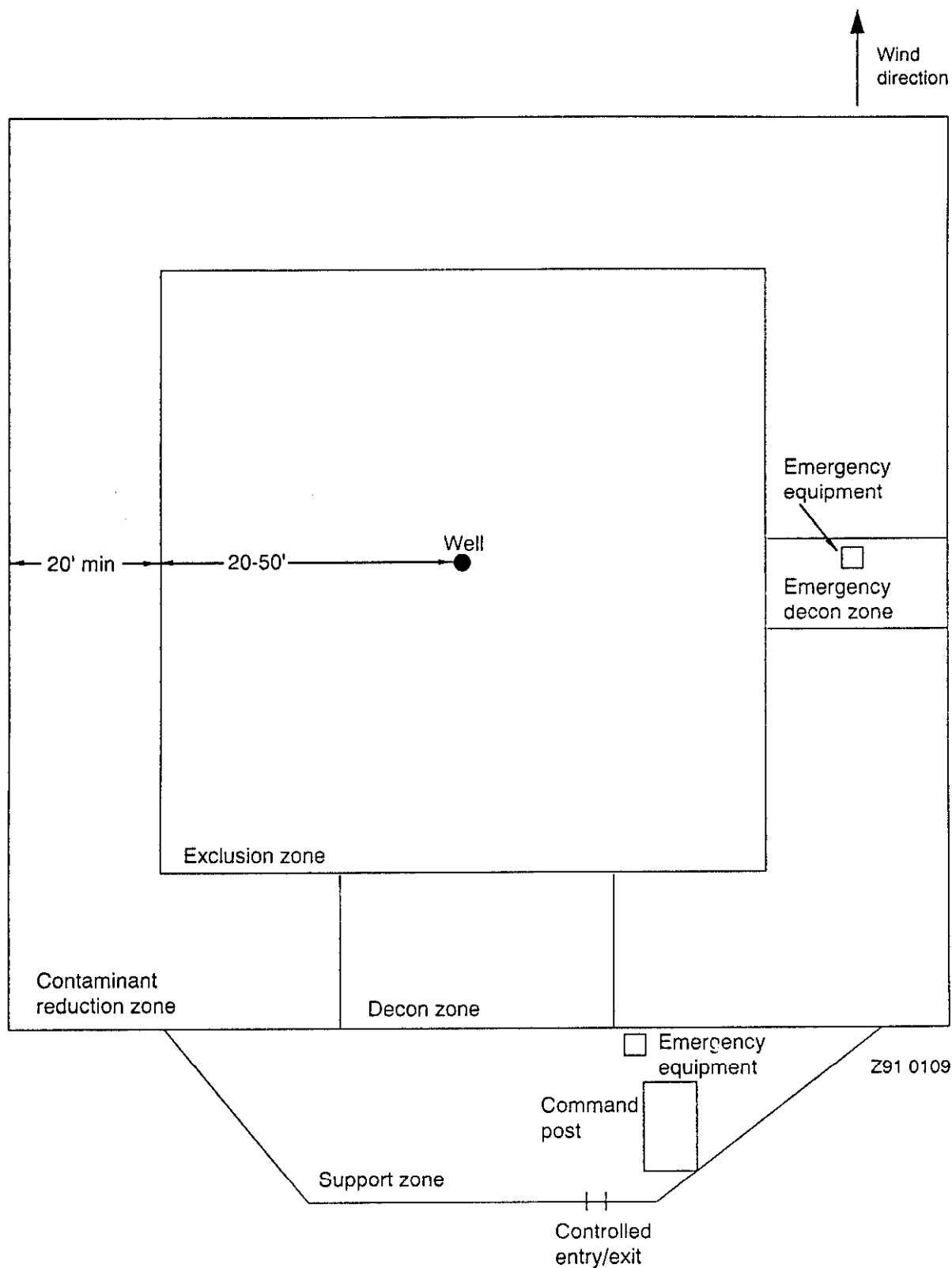


Figure A-3. Generic site map for activities on highly contaminated wells (update for each task).

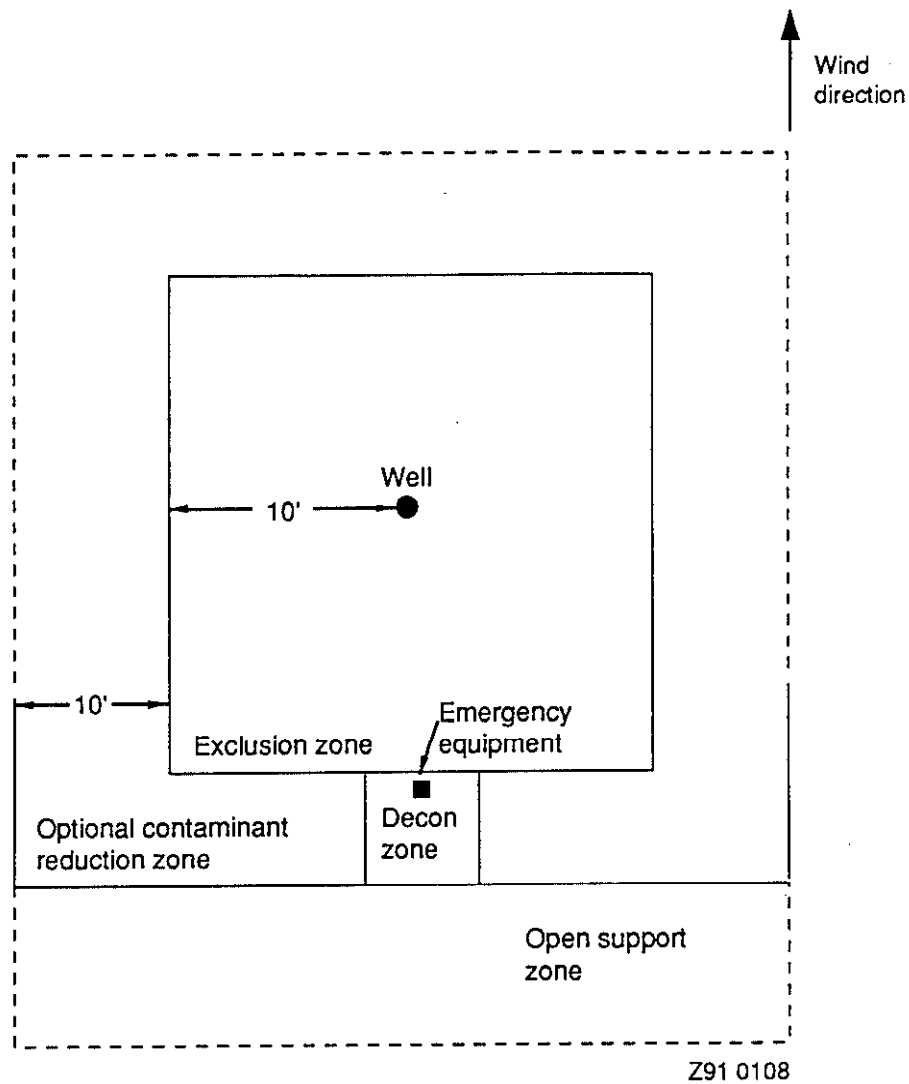


Figure A-4. Generic site map for activities on wells with low levels of contamination (update for each task).

A.9 ENVIRONMENTAL AND PERSONNEL MONITORING

A.9.1 Operations and Monitoring Equipment Checklist

Table A-6 shows the checklist used for operations and monitoring equipment.

A Ludlum 2A with a pancake-style GM detector will be used for detecting beta/gamma contamination. The detection limit for this instrument is 100 cpm above background. An instrument for alpha monitoring (ASP-1 or Ludlum 61) will be used to monitor for alpha emitters at the TSF-05 injection well site if required by the Site HP. Surveys by the HP will make sure that levels are less than 100 cpm above background beta and gamma and that there is no detectable alpha, to control exposure to any radioactive contaminants that may be present. If surveys detect levels greater than 100 cpm or any detectable alpha, operations will stop, and additional personnel protection will be implemented by the Site HP as necessary.

Tasks 1, 2, 4, and 5: All monitoring on wells with low levels of contamination will be intermittent (approximately 4 hours/day) unless levels indicate otherwise. The IH and HP will open the field site daily and check the calibration of instruments and perform or update the safe work permit and/or the job hazard assessment. The intermittent monitoring at the TAN groundwater monitoring wells will be done by trained field personnel under supervision of the site-certified IH. If readings are above the levels listed in Section A.6.3, all work will be shut down until readings return to acceptable levels. If high readings persist, work will not begin until IH and/or HP support is available. Training of the field personnel will be documented in the project, IH, and personnel files.

Task 1, 3, 6, and 7: Monitoring at the TSF-05 injection well and other highly contaminated wells will be done by the IH and the HP. The frequency of monitoring will be determined by the IH and HP. Any readings above pre-determined action levels in Section A.6.3 will necessitate that site operations be shut down until the IH and the HP are consulted and direct otherwise.

Table A-6. Operations and monitoring equipment checklist

<u>Type of Equipment</u>	<u>Number Needed</u>	<u>Calibrated^a</u>	<u>Field-Ready</u>
HNu or equivalent - with an 11.7 ev probe or lamp	1	Daily	Yes
Lud-2A or equivalent	1	Biannually	Yes
Lud-14.c or equivalent	1	Biannually	Yes
LEL/O ₂ meter	1	Weekly	Yes
Pump/draeger tube	1	Annually	Yes
Lud-61 or equivalent	1	Biannually	Yes

a. Calibration methods are contained in the company procedures or are available from the IH or HP personnel.

A.9.2 Medical Surveillance Procedures

All workers at the site with the potential for on-going exposures to hazardous substances or some other hazard that requires medical surveillance, will be entered by their managers into the Occupational Medical Program (OMP) in accordance with company procedures. The files of workers already in the OMP will be checked to see if the appropriate form (EGG 735) is available. OMP will be contacted to see if any updates to the form are required.

When notified of the need for a hazardous waste worker or other specific medical surveillance examination program, the Occupational Medical Program (OMP) will enter the affected employee into the appropriate surveillance program. The elements of these examinations can be tailored to the specific agent involved, but all include at least annual occupational, medical, and exposure history; a complete physical examination; and appropriate clinical laboratory studies.

A.9.3 Personnel Monitoring

For all tasks to be performed, the following personal monitoring device(s) shall be used:

- Breathing zone samples will be taken using the HNu. Organic vapor monitoring badges may also be used for personal samples (if applicable). The IH will perform this monitoring.
- Whole body "frisks" and surveys of the site will be conducted by the HP to assess contamination levels (if necessary). These surveys will be conducted in accordance with the *Radiological Controls Manual*, Chapter 4, Radioactive Contamination Control.
- TLD dosimeters will be worn by all sampling personnel.
- Combustible gas indicators will be used for situations in which combustible gases may be built up.

A.9.4 Operating Procedures and Methods for Surveillance

The Field Team Leader will be responsible to follow the guidelines set forth in the main body of this HSP for (a) heat and cold stress (Section 9.4), (b) work stress (Section 9.4), (c) barriers, signs, and tags (Section 9.6), and (d) physical hazard control and monitoring (Section 9.6).

A.10 DECONTAMINATION PROCEDURES

A.10.1 Personnel Decontamination Procedures

Chemical, radiological, and mixed contaminants decontamination will be handled in accordance with Section 10 of the main body of the HSP.

A.10.2 Decontamination of Sampling and Monitoring Equipment

Decontamination and cleaning of drill rigs and other drilling equipment will be accomplished by using a high pressure cleaner and uncontaminated tap water. For persistent contamination, this would be followed by a methanol rinse and a deionized or ASTM Type II water rinse. Procedures are documented in FSM #8 of the FSP.

The decontamination water will be contained and drummed as specified in the FSP. All decontamination water will be treated in the TAN Portable Water

Treatment Unit. Waste methanol will be drummed, sampled, and appropriately disposed depending on sample results.

Sampling equipment is decontaminated by washing and scrubbing using a non-phosphate detergent, followed by a potable water rinse, an ASTM Type II water rinse (if necessary), a methanol rinse (optional), and a second ASTM Type II water rinse, followed by air drying. Sample equipment decontamination is documented in FSM #8 of the FSP.

A.10.3 Decontamination Modification (e.g., personnel, surfaces, materials, instruments, equipment)

Personal protective equipment will be cleaned of soil or decontaminated with tap water before it is removed (if necessary). The cleaned PPE will be surveyed for hazardous and radiological contamination with field instruments and disposed of as cold waste if no contamination is detected.

A.10.4 Disposal Procedures

Onsite:

Materials and equipment for which decontamination is not feasible shall be surveyed for radiological contamination by the Project HP, and for organic contamination by the Project IH. Hazardous nonradioactive contaminated materials, radioactive mixed contaminated materials, and noncontaminated materials will be bagged separately, labeled, and stored in the corresponding drums at the site to await final data results for disposal. As previously noted, all waste water will be drummed and treated at the TAN Portable Water Treatment Unit.

Offsite:

There will be no offsite disposal with the possible exception of nonradioactive methanol used for decontamination.

A.11 EMERGENCY PROCEDURES, EQUIPMENT, AND INFORMATION

A.11.1 Emergency Reference List

Table A-7 shows the emergency numbers currently in use.

Table A-7. Emergency reference list

Warning Communications Center (WCC)	777
Area Emergency Action Director	6-2830
First Aid	6-6263
Occupational Medical Program	6-2356
Ambulance	777
Fire	777
Security	777
Safety Engineer Support	6-6004
TAN Industrial Hygiene (Nell Holtzclaw)	6-6406
Explosives expert (Richard Green)	6-2702
Health Physics	6-6288
Area Safety (Parley Williams)	6-6004
Area Operations Shift Manager	6-2509
Field Team Leader (J. F. Kaminsky)	6-9798
Project Manager (G. J. Stormberg)	6-1241

- a. This emergency reference list will be posted at each site.
-

A.11.2 Emergency Routes

During dayshift, Monday through Thursday, the TAN medical facility located at TAN-603 (phone 526-6263) is staffed by a full-time nurse. In addition, DOE-ID firemen at TAN-603 (phone 526-6261) are qualified to render first-aid assistance. Additional assistance can be obtained through the Central Facilities Area (CFA) medical facility (phone 526-2356); ask for the physician in charge.

A requirement of this HSP is that workers not already familiar with the location of the facilities mentioned above must tour the facilities before doing any work described in this plan. The field team leader will conduct any necessary tours.

Figures A-5 and A-6 show the TSF area and should be referenced for the location of TAN-603 (the TAN medical facility). This information will be posted at each site.

A.11.3 Emergency Procedures

In general, emergency procedures given in Section 11 of the main body of this HSP will be followed. In case of a large-scale emergency or major personnel injury, the TAN Area Emergency Plan will be implemented by the Facility Manager.

A.11.3.1 Additional or Modified Emergency Procedures. The F-net radio communication system will be available at the work site at all times, and will be provided by the HP or the Field Team Leader. A portable eye-wash station, a basic radiological contamination spill kit, a first aid kit, and a 20-lb ABC fire extinguisher will be available at the work site at all times. A vehicle will also be in close proximity and accessible during the entire project. Hand signals and the buddy system per Section 11.1.7 in the main body of the HSP will be reviewed and followed in an emergency.

A.11.3.2 Requirements for Task Site Evacuation. The FTL will evaluate and establish evacuation routes prior to the start of sampling activities at each well based on the information in Figures A-3, A-4, A-5, A-6, and A-7. The evacuation routes will follow the shortest distance over accessible roads to the medical dispensary in TAN-603 (Figure A-5). Notification will be performed by notifying the dispensary directly, by calling the warning communication center, or by contacting the shift manager. If deemed necessary, the patient may be transferred to CF-603 (Figure A-7) by medical personnel. CF-603 is located 27 mi south of TAN. Travel time is approximately 30 min. This information will be posted in the field logbook at the task site.

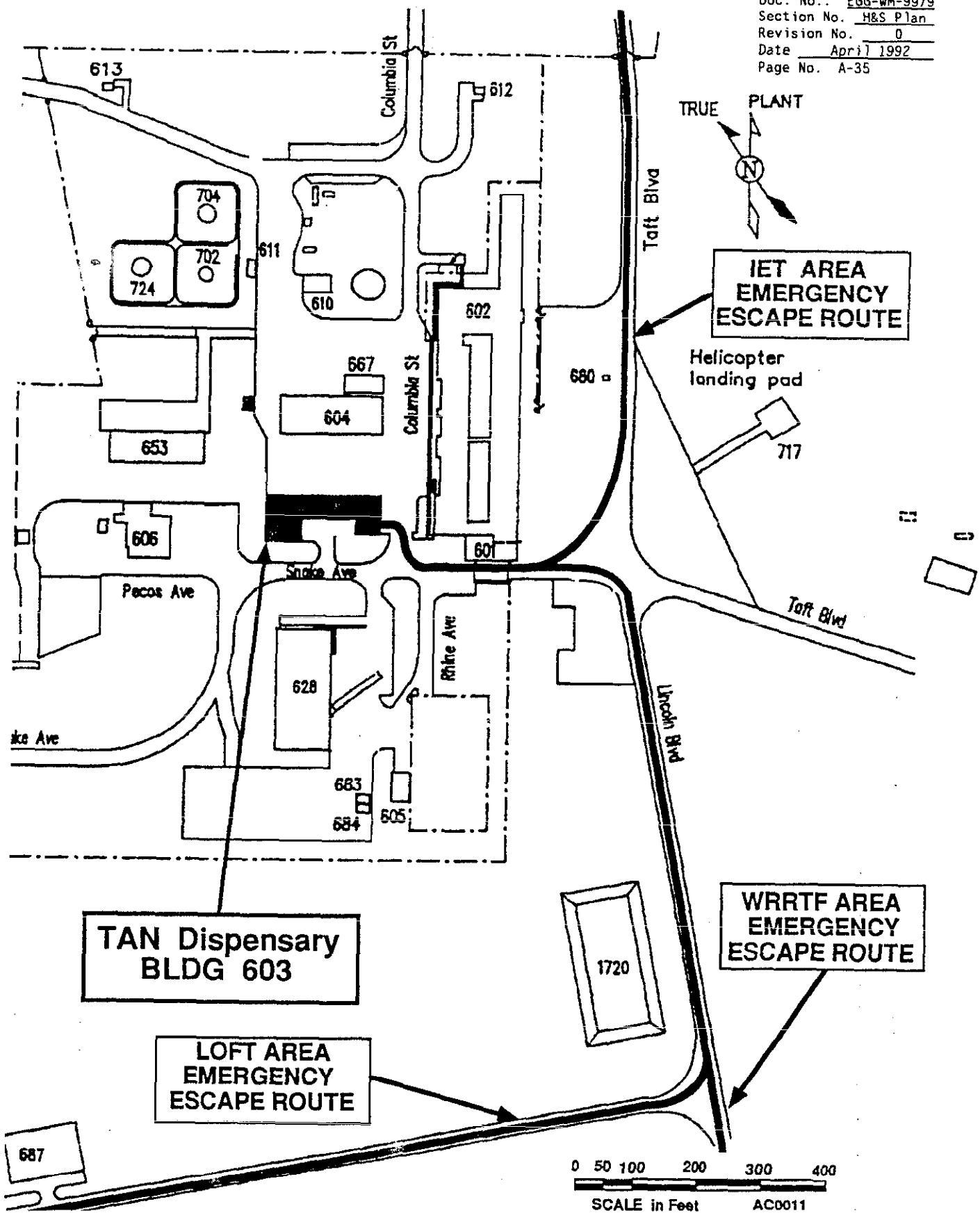
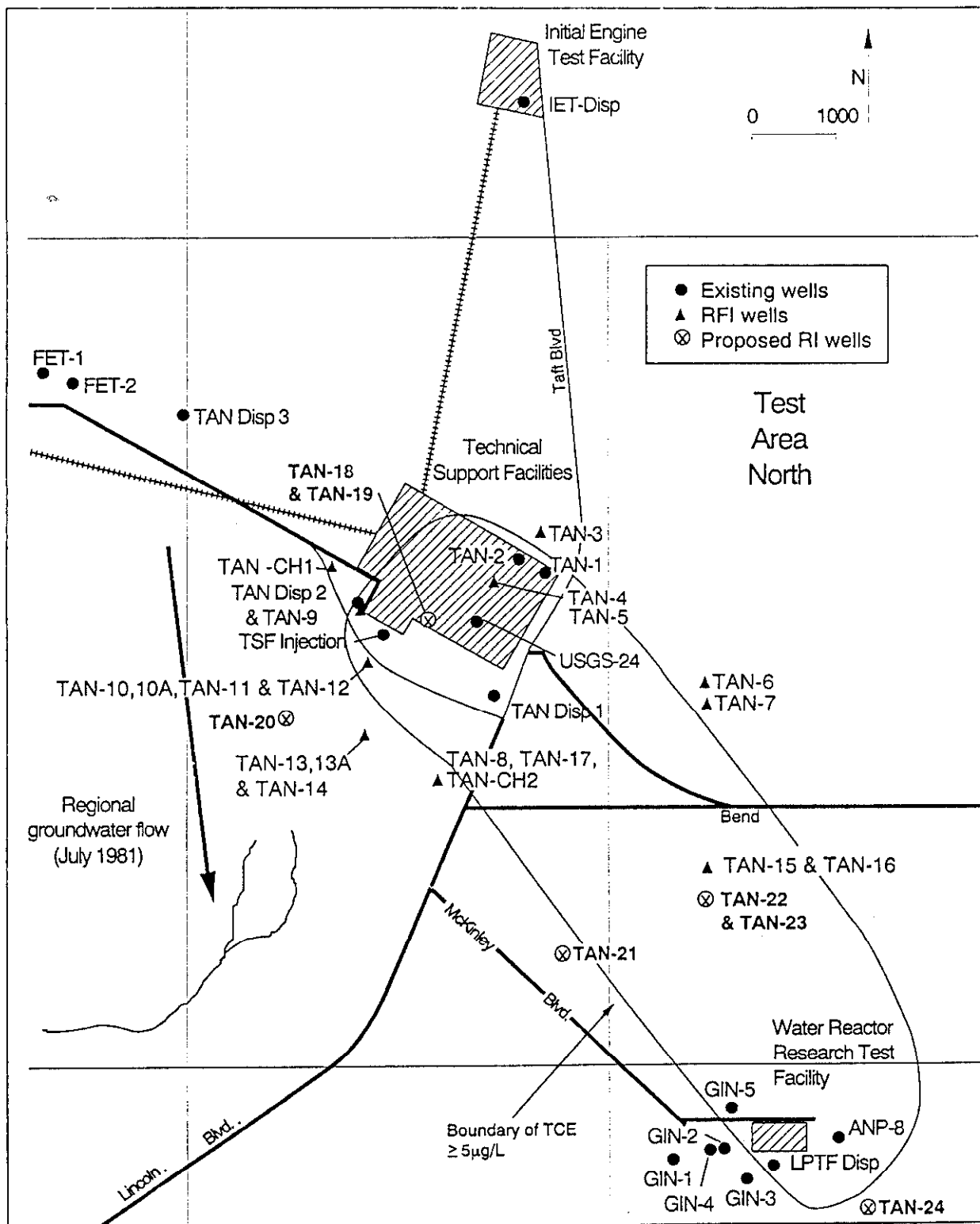
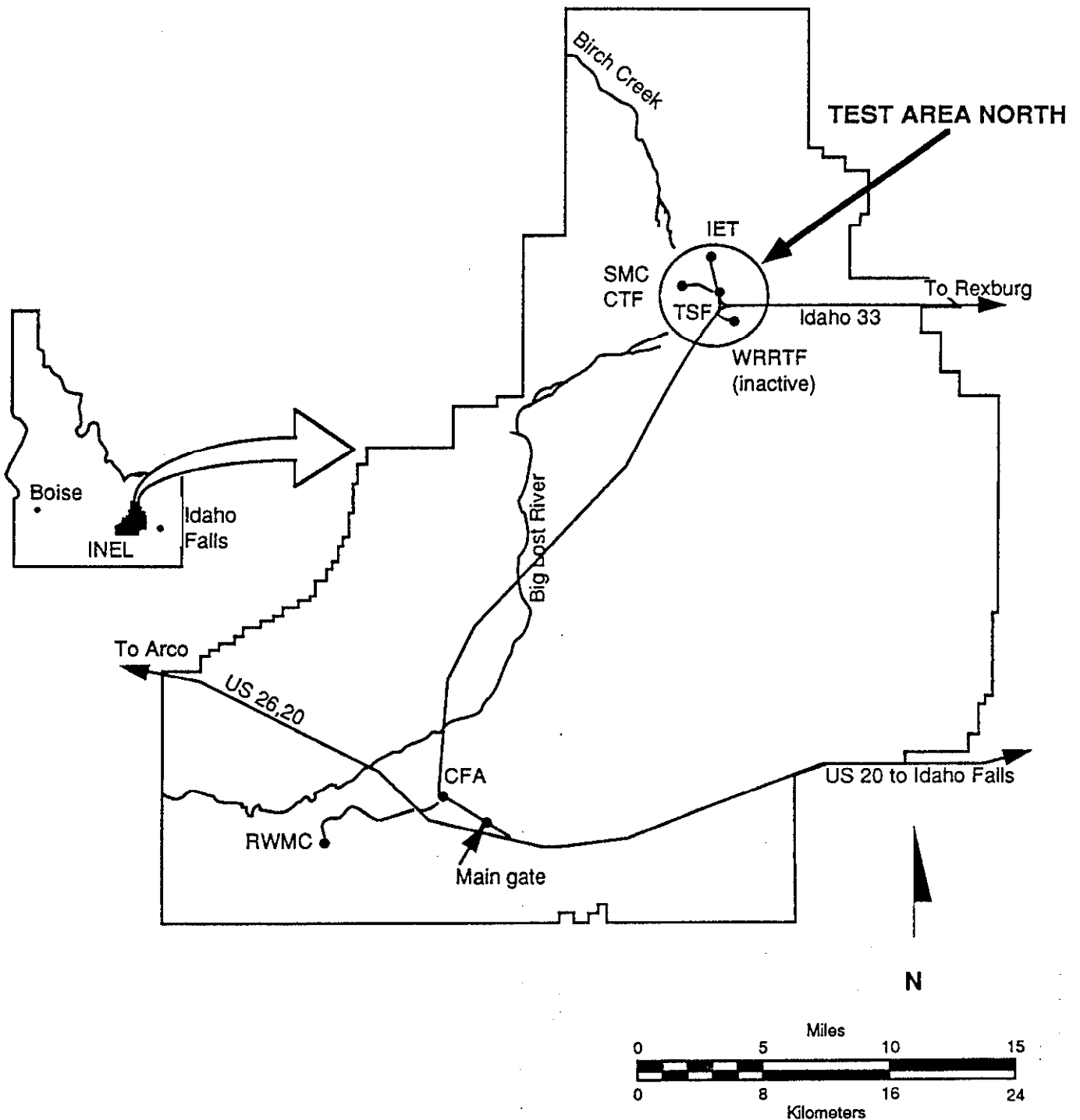


Figure A-5. Emergency route to the medical facility.



Z91 0087

Figure A-6. Emergency route from wells to the TSF area.



Adapted from M89 0133

Figure A-7. Emergency route to the Central Facilities Area.

Prior to starting work, the FTL will brief site personnel on the location of the emergency equipment and the evacuation procedures and route. The FTL will put a copy of Figures A-3, A-4, A-5, A-6, and A-7 in the field logbook that will have a highlighted site-specific evacuation route.

A.11.3.3 Task Site Warning Devices.

- Portable two-way F-net radio will be available at all times at each site
- Facility sirens for general area emergencies
- Hand and voice signals for task specific emergencies.

A.11.3.4 Task Site Emergency Responsibilities. Table A-8 shows the responsibilities of task site personnel.

Table A-8. Responsibilities of task site personnel

<u>Name</u>	<u>Responsibility</u>	<u>Action</u>
J. F. Kaminsky	Field Team Leader	Direct Task Emergency Site
Geologist	Drilling	Evacuation
EG&G Personnel	HP/IH	Recommend protective measures
J. R. Lord	Technician	Call for help as directed
G. W. Braun	Facility Manager	Initiate large scale emergency action as needed

A.11.3.5 Procedures for Inclement Weather. Operations will cease in the event of winds exceeding 25 mph on a sustained basis, electrical storms, heavy rains, or heavy snow as determined by the Field Team Leader and onsite IH or HP.

A.11.3.6 Reentry Procedures. If a task site emergency results in the evacuation of the task site, personnel shall reenter the task site only as directed by the FTL as specified in Section 11.1.10 of the main body of the HSP.

A.11.4 Emergency Equipment

Equipment will be inspected and maintained by the technicians. The FTL will check all emergency equipment prior to starting operations (Table A-9).

Table A-9. Emergency equipment

Fire extinguishers -

Number Available: 1
Location: On the transportation vehicle
Maintenance schedule: Monthly inspections

First Aid Kits (see Table A-10) -

Number Available: 1
Location: On the transportation vehicle
Maintenance schedule: Inventoried prior to sampling

Portable eyewashes -

Number Available: 1
Location: On the transportation vehicle
Maintenance schedule: Shall be stored empty. Prior to sampling activities, it shall be filled with clean water.

**Basic radiological contamination spill kit
(see Section 11.3 of the main body of the HSP) -**

Number Available: 1
Location: On the transportation vehicle
Maintenance schedule: Inventoried prior to sampling

Table A-10. First aid supplies

<u>Task</u>	<u>Date</u>	<u>Location</u>	<u>Kit No.</u>
All	May 1991	Transport vehicle	1
Items:			
2 boxes of triangular bandages		2 boxes of 4-in. bandage compress	
1 box of gauze pads		1 box of knuckle bandages	
3 boxes of 1-in. adhesive bandages		1 box of wound wipes	
1 box of iodine wipes		1 box of burn compound	
1 box of scissors and forceps		1 box of adhesive tape	
1 box of eye pads		1 box of ammonia inhalers	

A.12 ADDITIONAL INFORMATION

Offsite personnel (such as a cement truck driver) requiring entrance to the exclusion zone for a limited time, but not performing work that involves the potential disturbance of or contact with contaminated materials, will be allowed access if escorted by the Site Health and Safety Officer or the FTL but only during periods when no hazardous substances can be encountered, no hazardous operations are occurring, and/or hazardous operations have ceased.

Personnel with only incidental contact with the task (such as the cement truck driver listed above) will not be required to read this HSP but will be briefed on site emergency procedures. The decision concerning incidental classification will be made by the Field Team Leader in consultation with the Health and Safety Officer. If the requirement of reading this HSP is waived, the worker will be escorted to the task site while his job is being performed.

The Health and Safety Officer will not be required to be onsite whenever operations are present. However, this individual or designee will be available by at least radio or telephone for consultation concerning health and safety matters whenever operations are ongoing. When the Health and Safety Officer is not present, the FTL will be responsible for site safety.

A.13 HEALTH AND SAFETY CERTIFICATION FORM

Task Title:

Project Manager:

Field Team Leader:

I certify that I have been given a copy of the task-specific ERP Health and Safety Plan for the TAN Groundwater Operable Unit RI/FS Task and agree to comply with the procedures described therein. I further certify that I understand the potential health and safety hazards of the program (as outlined in this Health and Safety Plan) and have been trained in the use of personal protective equipment selected for this task.

Employee:

(Print)	(Signature)	(Date)
---------	-------------	--------

Company of Employment: _____

Field Team Leader:

(Print)	(Signature)	(Date)
---------	-------------	--------

Health and Safety Officer:

(Print)	(Signature)	(Date)
---------	-------------	--------